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THE RESOURCES

OF THE

STATE OF OREGON

THIRD REVISED EDITION

A BOOK OF STATISTICAL INFORMATION TREATING UPON OREGON AS A WHOLE AND BY COUNTIES

COLLATED AND PREPARED BY THE

STATE BOARD OF AGRICULTURE

1859.

SALEM, OREGON
W. H. LEEDS, STATE PRINTER
1898

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INTRODUCTION.

Section 6, of an act approved February 20, 1885, provides as follows:—

Sec. 6. The said board shall use all suitable means to collect and disseminate all kinds of information calculated to educate and benefit the industrial classes, develop the resources and advance the material interests of the state, collate and distribute all reliable information to encourage immigration, and shall, on or before the first day of December of each year, report to the governor a full and detailed account of their transactions, statistics and information gained, and also a full financial statement of all funds received and disbursed. They shall also make such suggestions and recommendations as experience and good policy may dictate for the improvement and advancement of the agricultural and kindred industries of the state. The rooms of the board shall be in the capitol building.

In accordance with the foregoing section the board, in 1888, collated reliable statistical and descriptive information and published an edition of 46,000 copies under the title "The Resources of Oregon." In 1892 a revision of that publication was made, brought down to date, of which an edition of 50,000 copies was published.

Requests for "The Resources of Oregon" are constantly received from all parts of the country, which cannot be supplied because the work is out of print and the edition has, long since, been exhausted. The population of the state has greatly increased, and the material interests have been further developed and additional enterprises have been inaugurated since the last publication. That this progress and development may be properly shown, and to meet the demand for information concerning the resources of our state, the board of agriculture at its annual meeting in November, 1897, decided to publish a third revised edition of "The Resources of Oregon."

Frank C. Baker, A. J. Johnson, and J. H. Albert, members of the board, were appointed a committee to take charge of the work. The committee employed J. T. Gregg of Portland, to collect and compile the requisite information.

Mr. Gregg, in January, 1898, sent a letter to county courts and other prominent qualified persons throughout Oregon, inviting them to furnish reliable information concerning the resources and development of their respective sections (counties) and of the condition and progress of the different interests of the people. The following subjects were suggested for consideration: Agriculture, Fruit Culture, Sheep-raising, Cattle and other live stock, Dairying, Lumbering, Flouring, Other Manufacturing, Fisheries, Mines, Mineral and Stone, Timber, Water-power and Transportation Facilities. This branch of the work will be found treated in detail under the titles "Counties of Western Oregon," "Counties of Southern Oregon," "Counties of Eastern Oregon."

Competent contributors were engaged to specially treat the various branches of our natural resources, and the result will be found in the following pages.

To the reader it can truthfully be said that the statements made are absolutely reliable, not in the least overdrawn, and will afford him a succinct and trustworthy account of the conditions, industries, resources, and possibilities of the State of Oregon, and of the enterprise and progress of her citizens.

In all cases the author's name accompanies his contribution; and where matter has been taken from papers, reports, or other source, the proper credit, if possible, is given.

The board, the committee, and the compiler, feel grateful to the public spirited ladies and gentlemen who have contributed to this work. They gave their time and their talent without pay. There is no doubt the public will appreciate their efforts.

259756

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THE STATE OF OREGON.

Oregon lies between the 42° and 46° north latitude, and 116° and 125° longitude, west from Greenwich. It is nearly square in form, the distance from north to south being 275 miles, and from east to west about 350 miles. It contains 95,274 square miles, or 60,076,000 acres, consisting of valley, hill, table land, and mountain. On the west it is bounded by the Pacific ocean, on the north by the Columbia river almost to its eastern limit, the State of Washington completing its northern boundary. More than half the eastern boundary is Snake river, the remainder the State of Idaho; and the southern boundary is California and Nevada.

The Columbia is one of the largest rivers in the United States. The Snake ranks well up among the large streams of North America. About 100 miles from the mouth of the Columbia are the cascades, a series of rapids in the river. At this point the government has built locks through which the largest river boats can pass. About 45 miles above the cascades is another series of rapids about 9 miles in length. Around these the government has surveyed for a ship railway, and proceedings are now in progress to acquire title to the right of way. An appropriation has been made to cover this expense and to begin the work of construction. It is proposed to commence the building of this railway as soon as the title to the right of way is perfected.

Deep water navigation now extends along the northern boundary of Oregon 150 miles, and when the ship railway is completed the distance will be extended to 250 miles. The Snake river runs north along the eastern boundary of Oregon 150 miles, and entering Washington empties into the Columbia a short distance north of the northern boundary of Oregon. This stream is navigable from its mouth to Lewiston, in Idaho, a considerable distance east of the point where it leaves the eastern boundary of Oregon. Thus, navigable water surrounds three sides of the state--the Pacific ocean on the west, the Columbia river on the north, and the Snake river on the east.

Along the coast are nine inlets from the sea exclusive of the Columbia river, which afford harbor facilities for vessels from the trading sloop to large coasting schooners and steamers. The Columbia is one of the best harbors in the world, and will admit the largest class of vessels.

Parallel with the sea shore extends the coast range, with an average height of 3,500 feet, densely covered with fir timber, the most of which is valuable for lumber. At a few points these mountains reach down to the ocean, but generally, there is considerable country between the mountains and the beach that is valuable for farming, grazing, and lumbering. Frequent streams issue from the range, several of which are navigable quite to the foot of the mountains, and run through fertile bottom lands suitable for agriculture and rich in timber products.

The Cascade mountains extend through the state from north to south parallel with the eastern and western boundaries, and are about 120 miles from the coast line. This range consists of a succession of peaks, the highest of which is Mt. Hood, a little more than 11,000 feet.

PHYSICAL DIVISIONS.

The state is divided, physically, into three divisions, known as Western, Southern, and Eastern Oregon.

WESTERN OREGON.

This division of the state includes the counties of Clatsop, Columbia, Multnomah, Clackamas, Marion, Washington, Yamhill, Tillamook, Polk, Lincoln, Benton, Linn, and Lane. Those on the Columbia are Clatsop, Columbia, and Multnomah. Those on the Willamette river are Multnomah, Clackamas, Washington, Yamhill, Marion, Polk, Linn, Benton, and Lane. Those on the coast are Clatsop, Tillamook, Lincoln, and Lane.

THE WILLAMETTE VALLEY

Lies in this part of Oregon. It is bounded on the south by the Calapooia mountains, on the east by the Cascades, on the west by the coast range, and on the north by the Columbia river. It is the wealthiest and most thickly populated section of the state. The length of the valley is 150 miles, its average width 60 miles, not including its mountain slopes, and presents one beautiful sweep of valley containing about 5,000,000 acres, all of which is highly fertile. It is drained by the Willamette river, which runs north and empties into the Columbia. This stream is navigable 120 miles. From their sources in the Cascades flow westward the Clackamas, Pudding, Santiam, and McKenzie rivers, and empty into the Willamette. The Coast Fork is an important branch. From their sources in the coast range flow eastward the Tualatin, Yamhill, LaCreole, Luckiamute, Mary's, Long Tom, and Calapooia rivers, which also empty into the Willamette. These are all streams of importance, some of them navigable, each draining a considerable country valuable for agriculture, fruit, stock, and timber. At about the center of the valley is the Minto Pass over the Cascades, through which a railroad, whose coast terminus is Yaquina bay, in Lincoln county, is building to traverse Eastern Oregon. The elevation of the center of the valley ranges from 70 feet at base of falls of Willamette at Oregon City to 400 feet at the southern extremity. There are broad and fertile prairies separated by streams, shaded by strips of woodland, and heavy forests of timber trees cover the mountains and hilly slopes. Outside of the level prairies there is a belt of rolling land verging into hills and mountains in the higher portions, which extends entirely around the valley and constitutes a very valuable part of the country. The soil of this portion is mainly basaltic and sandstone, and of great general fertility. Its products are more diversified than those of the lower lands, and frequently exceed them in quality. These rolling or hill lands are usually covered with brush. The principal advantage of the brushy tracts are good soil, natural drainage, good water, a climate beyond the reach of malaria, an ample supply of wood for fuel and building purposes and comparative freedom from early frosts. The tract under description does not embrace all the brush lands of the valley, but includes the greater portion. There are small tracts of bushes and young trees in nearly every section, but they are isolated by stretches of prairie. The foot hill lands lie at an elevation of 500 to 2,000 feet, and vary in width between these boundaries. When cleared, the brush lands are as productive as any that exist.

Large quantities of these desirable lands, mostly wooded, lie upon the upper courses of nearly every one of the tributaries of the Willamettee. They have the advantage of drying earlier in the year than the valley lands, whereby it becomes possible to cultivate the soil to a better advantage. A greater variety of farm products can be raised in the hills, and their quality is choicer. A large extent of valuable hill land is found in Clackamas, Marion, Linn, Lane, Washington, Yamhill, Polk, and Benton counties, where on the large affluents of the Willamette room for many hundreds of settlers is found. Of these streams, the principal are the Clackamas, Molalla, Santiam, McKenzie, and Coast Fork. The last, as an example, is a fine stream flowing northward over a rocky bottom, through narrow channels, and entering the main river not far from the city of Eugene. The McKenzie flows through large tracts of unclaimed timber and railroad lands where settlement can be profitably made. Much good agricultural land lies as high as 2,500 feet, being in small isolated valleys and difficult of access. The quality of the soil is high, producing with unfailing regularity the crops possible to the latitude. They are particularly adapted to stock raising, and many thousands of acres are yet open to settlement.

The timber lands lie mainly upon the interior slopes of the inclosing mountains. The extent of the forests is prodigious, and as yet only the vaguest statements can be given as to the available quantity. Speaking generally, there is a belt of timber trees upon the western slope of the Cascades that is twenty or more miles wide and extending north and south the whole length of the range. A great part of it is inaccessible at present and will so remain until the demand for lumber justifies the investment of capital to build roads into the timber region.

SOUTHERN OREGON.

This division of the state embraces the counties of Douglas Coos, Curry, Josephine, and Jackson. It is south of the Willamette valley, from which it is separated by the Calapooia mountains, adjoins California on the south, the Siskiyou mountains lying between, with the Cascades on the east and the Pacific ocean on the west. The surface of the country is mountain, hill, and valley, every part of which is valuable. The mountains for mineral deposit, the hills for timber, grazing, and fruit culture, and the valleys for every class of agriculture possible to the temperate zone. The principal streams of this section are the Umpqua and Rogue, which pierce the Coast range and join the Pacific. Along the first named stream is the Umpqua valley, surrounded by the Calapooia mountains, the Coast range, the Cascades, and the Rogue river mountains. This is a rich grazing, agricultural, and fruit-growing section. The surface is undulating and sparsely timbered with live and white oak. The soil is exceedingly fertile, the range grasses and climate rendering it peculiarly well adapted to sheep culture and dairying. The slopes of the Cascades and Coast range are heavily timbered with fir and cedar, like the slopes around the Willamette valley.

The Rogue-river valley lies between the Siskiyou and Rogue-river mountains and the Cascades and the Coast range. The surface of the valley is level, sloping gracefully back to the Cascades and meeting the other mountains somewhat abruptly. This slope, like the Umpqua, is dotted over with white and live oak. All the lands of this valley are very fertile, the soil and climate conducing to the growth of fruit of all kinds, especially peaches and grapes. The soils of the foot hills and slopes of this valley are better adapted to fruit culture than are the valley lands. The mountains adjoining on the north, west, and south are rich in deposit of gold, which is extensively mined. The country between these valleys is embraced by Josephine county, which is principally mountainous. Along the small streams are numerous vales of great fertility, all of them producing fruit of excellent quality. This county is essentially a gold producing section. The mines are extensively worked and very remunerative. Throughout this part of Southern Oregon, and along the Rogue river, in the foot hills, are extensive forests of sugar pine, valuable for finishing lumber.

The portion of this section west of the Coast range, embracing Coos, Curry, and a portion of Douglas counties, is generally heavily timbered with fir, spruce, and cedar. Stretches of rolling land exist practically devoid of timber, producing excellent grasses for grazing purposes. The land is fertile and suitable for agriculture and all kinds of fruit. Extensive coal deposits are found, some of which are developed and yield abundantly. Coos bay is one of the best harbors on the Oregon coast. Salmon fishing is profitably pursued at the mouth of Rogue, Coquille, and Umpqua rivers.

EASTERN OREGON.

This division embraces all the state east of the Cascades from California and Nevada on the south to Washington on the north. It is in the form of a parallelogram, 275 miles long and 280 miles wide, and includes the counties of Klamath, Lake, Harney, Malheur, Crook, Grant, Baker, Wasco, Sherman, Gilliam, Morrow, Umatilla, Union, and Wallowa. This portion of the state is a plateau whose surface lies at a height above the ocean of from 2,000 to 5,000 feet. In the northeastern part of the state between the Snake and Columbia rivers are the Blue mountains whose summits are more than 6,000 feet high. The influence of the mountains is beneficial to agriculture, as their height causes a considerable fall of rain and snow which gives rise to numerous streams whose waters are used for the purposes of irrigation. This is also the important and valuable mineral belt in the state, especially rich in gold. The valleys and hillsides are covered with grass, excellent and abundant, affording pasture for large numbers of cattle, sheep, and horses.

The southern portion of Eastern Oregon contains a number of short mountain ranges from 2,000 to 3,000 feet high. Between these mountains are the valleys, deeply filled with sediment, and are so nearly level that the rains and water from melting snow form vast marshes. Between the Deschutes and Crooked rivers on the west, north, and east and the high lands of Lake county on the south is an extensive tract of country known as the Sage Plains. This tract, at present, is comparatively barren. Rain does not fall in sufficient quantities at the proper season to encourage vegetation. Irrigation, however, has developed the fact that the land is fertile and produces abundantly when supplied with water. Fortunately, the greater part of this tract is so situated that it can be furnished with water for irrigation purposes.

The principal rivers of eastern Oregon are the Snake, Deschutes, John Day, Powder, Owyhee, Malheur, Crooked, Burnt, and Grande Ronde. All these rivers have numerous streams flowing into them. Along most of these rivers and streams is a growth of timber, consisting of pine, fir, and tamarack, a large part of which is suitable for lumber. On the mountain slopes the same kinds of timber of excellent quality grow in profusion; but in speaking of eastern Oregon generally, it may be said that the supply of timber for lumber is inadequate to the demands of the country for building and fencing purposes. It is rich in deposit, and in many parts of its entire extent agriculture is pursued with profit. The extensive table and rolling lands are not cultivated, principally on account of insufficient rainfall, lack of transportation facilities, and remoteness from market. They afford, however, a generous yield of bunch grass, which makes stock raising the prevailing occupation of the people. The establishment of an effective system of irrigation, and the building of railroads will transform these ranges into waving wheat fields.

For a more elaborate description of this part of the state, and of the other divisions, the reader is referred to what is said under the head of the respective counties.

POPULATION.

Published in the Oregonian, January 1, 1898.

Conservative estimates, made for the annual number of the Oregonian, place the population of the state at 420,760, a gain of 58,247 compared with the state census of 1895, and of 106,993 compared with the federal census of 1890. The population of Oregon undoubtedly is between 400,000 and 425,000, so that the Oregonian's figures are not far out of the way. By counties the population is:

Counties.	*Population.*
Baker	13,000
Benton	7,500
Clackamas	25,000
Clatsop	12,000
Columbia	6,100
Coos	9,500
Crook	5,000
Curry	3,000
Douglas	17,000
Gilliam	3,000
Grant	4,300
Harney	3,500
Jackson	15,000
Josephine	6,500

POPULATION BY COUNTIES—CONCLUDED.

Counties.	*Population.*
Klamath	2,500
Lake	2,300
Lane	22,000
Lincoln	5,500
Linn	19,000
Malheur	4,000
Marion	33,000
Morrow	3,600
Multnomah	100,000
Polk	11,200
Sherman	3,051
Tillamook	4,500
Umatilla	13,609
Union	13,500
Wallowa	4,100
Wasco	15,000
Washington	18,500
Yamhill	16,000

By geographical divisions the population is distributed as follows:

West of the Cascades	331,300
East of the Cascades	89,460
Total	420,760

The counties which have made the greatest gains since the census of 1890 are Baker, Clackamas, Douglas, Jackson, Lane, Linn, Marion, Multnomah, Polk, Wasco, Washington, and Yamhill. They are the counties which, by reason of their varied resources, their industrial development and their close proximity to the transportation routes, would be the ones most likely to get the largest percentage of the new comers. They undoubtedly have the population credited to them in the foregoing statement.

SOIL.

In the valleys of Oregon the soil is a loam, dark and rich, with a subsoil of clay. The bottom lands along streams consists of rich deposits of alluvium. "The beaver-dam" lands are of this class. As the name indicates, this land has been formed through the work of these animals in years gone by, they having dammed up streams, causing lakes, which were filled with vegetable matter. The water dried and drained away. Settlements encroached upon the seclusion of the beaver and drove him farther to the front. This land is wonderfully fertile and exceedingly valuable.

The soil of the uplands, naturally is less fertile than that of the bottoms and valleys, and is a red, brown and black loam. It produces an excellent quality of natural grass, and under careful cultivation produces good crops of grain, fruit, and vegetables.

East of the Cascade mountains the soil is a dark loam of great depth composed of alluvial deposits and decomposed lava, overlying a clay subsoil. The latter rests upon a basaltic foundation, which is so far below the surface as to be visible only on the banks of the deep water courses. The constituents of the soil adapt the land peculiarly to the production of wheat. All the mineral salts which are necessary to the perfect development of this cereal are abundant, reproducing themselves constantly as the gradual process of decomposition in this soil of volcanic origin proceeds. The clods are easily broken by the plow, and the ground quickly crumbles on exposure to the atmosphere.

In Northwestern Oregon, adjacent to the Columbia river, although the dry season continues for months, this light, porous land retains and absorbs enough moisture from the atmosphere, after the particles have been partially disintegrated, to insure perfect development and full harvest.

In Southeastern Oregon, notably in the vast areas of fertile land in Malheur and Snake river valleys, the soils are much like those of the Northeastern Oregon region, but there is less moisture. Except in a very small portion of this region irrigation is necessary to a successful agriculture. Fortunately the water supply is abundant, and easily applied.

THE CLIMATE OF OREGON.

Compiled from the official records of the United States Weather Bureau, by B. S. Pague, officer in charge.

The climate of Oregon is apparently the one thing which the people of the east find it difficult to understand, and a simple and unexaggerated statement of the actual facts relating thereto is generally regarded by those who have never spent a winter this side of the Rocky mountains as a misrepresentation made for the purpose of inducing immigration. This arises from the fact that most persons regard climate as depending entirely on latitude, and consider it impossible that a section so much further north than the central part of the Mississippi valley as this section is can have so much milder and more favorable winter climate than that section has. But if they will for one moment consider how great is the difference in climate between Europe and the eastern part of the United States, of the same latitude, they will realize that there are other elements than latitude which go to make climate, and will no longer regard the statements as to Oregon as at all improbable.

Oregon is so often referred to as "the place where it rains all the time." A more erroneous idea of the rainfall of the state is impossible, as will be seen by a perusal of these pages. Over the extreme western portion of the state, west of the Coast range of mountains, consisting of about one tenth of the entire area of the state, the annual rainfall is from 50 to 80 inches, or an amount about equal to that which annually occurs along the Atlantic coast from Norfolk southward to Key West and along the Gulf coast to eastern Texas, covering Louisiana, Mississippi, and Alabama, a portion of Arkansas and a portion of Tennessee. Except this coast region of Oregon, in all that portion of the state west of the Cascade mountains, about one fourth of the area of the state, the annual rainfall is equal in amount to that which occurs over that portion of the United States east of a line drawn from Duluth to Omaha, to Oklahoma, to San Antonio, thence to the Gulf, except those portions before mentioned. The remainder, or nearly three fourths of the state, has an annual rainfall equal to that of Colorado and New Mexico. The city of Portland has an annual rainfall of 46 inches, Chicago has 34 inches, St. Louis 41, New Orleans 60, Galveston 48, Nashville 50, Vicksburg 53, Jacksonville 54, Chattanooga 54, Cincinnati 42, Washington City 43, New York and Boston 45 inches. Considering these actual statistics it is seen that it is as erroneous to speak of Oregon as a rainy place as to speak of Nebraska, Kansas, Colorado, and surrounding states being in the Great American desert, as was understood to be the case 50 years ago. Imperfect knowledge of the trans-Mississippi states caused them to be recorded in early geographies as "the Great American desert" in the same manner Oregon was erroneously classed.

GEOGRAPHY AND TOPOGRAPHY.

Oregon lies in about the extreme northwestern section of the United States, with its western boundary the ocean, its northern boundary the state of Washington, from which it is separated by the Columbia river: its eastern boundary is Idaho: its southern, Nevada and California. The Cascade mountains traverse the state from north to south about two thirds westward of the eastern boundary; its spur, the Blue mountains, extends northeasterly to the Snake river, which flows between Idaho and Oregon; the Calapooia mountains extend from the Cascades to the Coast range about midway in the section west of the

Cascades; the Siskiyous form the boundary with California, and the Coast range borders on the western or shore line. It will be thus seen that mountains cut up the state considerably. It lies principally between the 42° and 46° north latitude, between 117° and 124° west longitude. It has an area of nearly 95,000 square miles, or about 61,000,000 acres. It is as large as all of New England and two thirds the state of New York added thereto, or larger than the states of New York and Pennsylvania combined. The general surface of the state is undulating, and has elevations of from the sea itself to 5,000 feet, and with the mountains rising to 12,000.

CLIMATE.

The climate of the state from the latitude, that of the Great lakes and southern Maine, would seem to indicate the same extreme and the same rigor, but owing to its proximity to the ocean and the Japan gulf stream, its climate is free from those severe extremes of temperature and storms which make life unpleasant and soil production small and difficult. The Rocky mountains to the east are also part of the modifying influences which make the climate so different from that which it naturally would be. They act as a barrier to the cold, northerly winds of North America, deflecting to the east that severe cold which otherwise would move southerly over the state.

Yet, with these modifying or tempering influences, there exists in the state a great variety of climates, all modified from what they would be were the physical conditions different. Within the borders of the state can be found climates ranging from that of the sunny hillsides of Italy to that of the frosty regions of Minnesota; from the humid atmosphere of Alaska to the arid regions of California. The topographical features of the state produce the various climatic conditions. The air, laden with moisture, passes from off the ocean, and meets its first obstruction, the Coast range of mountains, on which and to the westward to the ocean the moisture is condensed and falls in the form of rain. The amount of rainfall along the coast varies from 58 to 75 inches; there being a greater amount in the northern and southern portions of the coast section than in the central section. The moisture which is not precipitated on and to the west of the coast range, is carried across the coast range and distributed through what is locally called the Willamette, Umpqua, and Rogue river valleys—valleys extending from the Columbia river to the California line. These are the interior valleys, and in them the moisture decreases from the north to the south, the average rainfall at Portland, in the north, being 46 inches annually, while at Ashland, on the south, it is but 21 inches annually. The moisture laden winds, continuing on their eastern course, pass over the Cascade mountains, and, having deposited a large portion of their moisture already, but little remains for the vast area east of the Cascade mountains, termed Eastern Oregon. This section of the state has an elevation south of the Columbia river valley of from 2,000 to 6,000 feet, and has an average annual rainfall of from 10 to 15 inches. In the Columbia river valley the annual rainfall varies from 14 to 20 inches. This brief résumé shows a decline in the amount of precipitation from the west to the east, and by comparing them with the thermal conditions it will be found that the greater the precipitation the less the range in temperature, and the less the precipitation the greater the range.

The productiveness of a region depends more upon its exemption from great ranges in temperature and an average and almost constant amount of rainfall than upon any other conditions. The precipitation has been briefly outlined, and now we will briefly speak of the distribution of temperature. Owing to the influence of the ocean, that portion of Oregon lying west of the Coast range of mountains has a most constant and equable temperature. As a rule, a temperature of 32° is experienced every winter, while the extreme summer temperature is not quite 90°. Extreme temperatures as low as 10° above zero have been recorded, but such are very unusual, and of infrequent occurrence. To the east of the coast range and west of the Cascades—the great agricultural valleys of Oregon occupy this area—is found a greater range in temperature, though seldom more severe. Through the Willamette valley the lowest temperatures on record occurred in January, 1888, when the temperature fell from 2° to 6° below zero. In the Umpqua valley at the same time it was 6° below zero, while at Ashland, in the Rogue river valley, it was 8° below zero. In this connection, it may be well to state that these temperatures are the lowest known in the section mentioned, and that during the cold period in which these low temperatures were recorded in the valleys of Oregon, orange trees were frozen in southern California, about Los Angeles. Through the great plains and valleys of Oregon lying to the east of the Cascade mountains the minimum winter temperature is much lower, zero temperatures occurring every winter, and frequently the temperature falls to 10° and 15° below zero. The period of extreme cold is of comparatively short duration, though it is at times severe. The maximum summer temperature in the valleys between the Coast and Cascade ranges of mountains ranges usually between 75° and 90°. In July, 1891 (the 23d), the highest temperature on record prevailed for a few hours. At Portland it was 102°; at points in the central portions of the Willamette valley it was from 100° to 105°; in the Umpqua valley it was 102°; in the Rogue river valley it was from 103° to 108°. In the eastern portion of the state temperature of from 90° to 103° occurs every summer.

The foregoing is briefly the extremes of temperature. In this article it is not intended to touch upon the mean temperatures, for from that one is not enabled to determine the practical variation in temperature, hence the possible soil productions. At this period it may be well to describe general atmospheric conditions during the prevalence of the extreme high temperatures. The sky is generally cloudless; the wind has a velocity of from 4 to 8 miles per hour; the air has a relative humidity of less than 40% saturation. It is this latter feature that prevents any harmful or specially injurious effects. The nights are always cool, no matter what may be the extreme day temperature; hence during a heated term, which never lasts over three days, the nights are cool, the minimum temperature being from 50° to 65°; the morning opens with a temperature at 9 o'clock of about 75° and a relative humidity of 70%. As the day advances the temperature rises and the relative humidity falls, until about 4 p. m. the temperature has risen to 95°, while the relative humidity has fallen to about 20% saturation. The high temperature necessarily heats the body and the blood and causes perspiration to ooze from every pore. The heathful effects of the low relative humidity and the preventive for the debilitating results is shown by the fact that the dry air evaporates the moisture as it appears on the body, thus keeping the body much cooler than it otherwise would be. It is owing to the cool nights and low humidity that sunstroke and other injurious effects of hot weather are unknown in Oregon. The low humidity allows of rapid evaporation from the vegetation as well as from the body, thus depriving the soil of much of its needed moisture. Here, again, nature has supplied a great restorer in the dews of night, which greatly tend to restore the loss of moisture during the day. Through the humid and thickly settled portions of the east and south the cooling effects produced by evaporation on the body are missing, which, together with the high night temperature, produce a continued heating of the blood, finally resulting in sunstroke. Within the state of Oregon can be found many varieties of climate, each suited to some special production, and each beneficial to some variety of disease. Pulmonary troubles find relief in various localities of the state lying to the east of the Cascades and Blue mountains, while another variety of pulmonary disease may find relief along the coast counties. In such cases the disease must seek its peculiar curative climate. Some sections of the state are beneficial to rheumatism and asthmatic troubles, while others are deleterious.

FROST.

The frost extends over a period, depending of course upon the location and elevation. Along the coast the frost period covers from November 1st to March 1st of each year. In the Willamette valley the possible frost period is from October 15th to April 15th. In the Umpqua and Rogue river valleys the frost period is from October 1st to May 1st. Along the Columbia river valley it is about the same. East and south of the Blue mountains the period of frost is greater. In some sections, on the higher elevations, frost occurs almost every month, while in other sections, of lower elevation, it does not occur during the period from May 15th to September 20th, sufficient time for vegetation to mature. Throughout the western portions of the state a non-frost period of six months can almost always be depended upon. A peculiar feature concerning frost is that in the spring and autumn, and frequently during winter, a clear, frosty night is followed by a densely foggy morning, which being impregnated with moisture, dissolves the frost, and ere the sun dissolves the fog formation the frost has disappeared and no injurious effects result, for it is the rapid thawing after frosts that does the damage to vegetation rather than the frost itself. It frequently happens, too, that when the temperature sinks low enough to allow of frost to be formed, that the fog comes on and prevents the formation of frost, for the fog acts as a covering to the vegetation and protects it. If it were not for these fog formations (which begin about from 3 to 6 a. m. and continue to 8 or 9 a. m., when they rise, form a lower cloud until about 11 a. m., when the sky becomes clear) the fruit-buds in the spring would be frequently and seriously injured.

THUNDER.

Owing to the cool nights and usual high relative humidity at night, the electrical conditions of the atmosphere are kept more in equilibrium, and prevent the formation of thunder-storms and other severe atmospheric disturbances. Thunder is at times heard and lightning is sometimes seen, but they are so faint—and they are never severe—that it is generally said that thunder-storms are unknown in Oregon. This is partly true, though not literally, yet they do not occur with the frequency nor the violence that they do in the east. In eastern Oregon thunder-storms are more frequent than in the western portion of the state. Those in eastern Oregon are frequently accompanied by a heavy downpour of rain, though seldom is the electrical disturbance severe.

STORMS.

Severe storms, *i. e.* destructive to life and property—cyclones, tornadoes, and other great atmospheric disturbances—are unknown. This exemption is due to the equable thermal conditions, for without great and sudden changes in temperature no severe disturbances are possible. The general velocity of the wind is much less through Oregon than obtains in the major portion of the world. The movement of the wind is greater during the summer afternoons, due to the sea breeze, than at any other period of the year, during which time the wind has a velocity of from 6 to 15 miles per hour. During the winter season the winds average a higher velocity. The average hourly velocity of the wind is from 3 to 5 miles in Western Oregon, and from 6 to 8 miles in Eastern Oregon. The general velocity of the wind through the United States ranges from 5 to 10 miles per hour. The prevailing direction of the wind from October to April is from the south quadrant, while from April to October it is from the north quadrant. Possibly the most healthful feature of the wind's movement is the daily sea and land breeze which prevails over the greater portion of the state for the major portion of the year, and gives a healthful and invigorating atmosphere to all life, at the same time tempering the heat and cold, and making the Oregon climate equaled by few and surpassed by none—surpassed by none, when the healthfulness of the people, the productiveness of the soil, and luxurious vegetation are considered.

SEASONS.

The seasons in Oregon are distinguished as the wet and dry seasons, more than by the usual designations of winter, spring, summer, and autumn. The wet season is not, as it is usually understood to be, wet or rainy all of the time, nor does the dry season indicate absolute dryness; but rather during the wet season about 75% of the annual precipitation occurs, while during the dry season the remainder occurs in the shape of infrequent showers. The period allotted to the dry season extends from May 1st to October 15th. Usually there are a few showers during September, and they become more and more frequent until the rains set in about November 15th, from which date to March 15th rains are expected on about 4 days out of 6. From March 15th to May 1st the showers at intervals occur as in October.

THE CLIMATE OF THE VARIOUS COUNTIES OF OREGON.

Due to the topographical features, the state has several distinct and well-defined climatic and soil conditions. For the purpose of brevity, the counties are grouped in the following divisions, and the divisions will be treated of rather than the county singly. The natural divisions of the state determine the following arrangements according to counties:—

Coast—Embracing Clatsop, Coos, Curry, Lincoln, and Tillamook counties.

Willamette Valley—Benton, Clackamas, Columbia, Lane, Linn, Marion, Multnomah, Polk, Washington, and Yamhill counties.

Southern Oregon—Douglas, Jackson, and Josephine counties.

Columbia River Valley Counties—Gilliam, Morrow, Sherman, Umatilla, and Wasco.

Interior Counties—Baker, Crook, Grant, Harney, Klamath, Lake, Malheur, Union, and Wallowa.

THE COAST DISTRICT.

The counties comprising the coast district are covered with timber; low mountain ranges traverse them, and from the climatic conditions they are especially suited to dairy interests. The streams abound with salmon, the timber is principally fir, known as Oregon pine; spruce, cedar, and hemlock are in large quantities. The soil is principally a sandy loam; grass, oats, fruits, and vegetables grow prolifically; rutabaga, carrot, and beet, suitable for feed for stock, grow most wonderfully; potatoes are especially adapted to the soil and climatic conditions. In many locations cranberries are a very profitable crop, and in this product a good future lies before it. The rainfall of this district is upwards of 60 inches, being the region of heaviest rainfall in the state. Rain falls on from 104 to 188 days in the year. The heat of the summer is rarely above 80°, and the cold of winter is rarely below 20°. A temperature of zero is unknown; frost seldom penetrates the ground. The result is the grass is green throughout the year and stock need never be housed to be fed. There is an entire absence of the enervating summer heat and suffering from cold. The district is possibly the most healthful in the state; there is an almost entire absence of fever and of those diseases peculiar to children. The climate is moist but healthful, and adapted to many varieties of agricultural operations.

WILLAMETTE VALLEY.

The counties composing the Willamette valley are the most thickly populated of any in the state. This valley has been settled since 1844, though thorough settlement did not begin until about 1850, and even yet there are many thousand acres of government land to be taken up. The valley in the main is undulating; the Willamette river drains the valley, the Coast range of mountains is on the west, the Cascade mountains on the east, the Calapooia mountains on the south, and the Columbia river on the north. The entire valley contains about 5,000,000 acres, and is capable of supporting many million people. Timber is plentiful throughout the valley, consisting of fir, cedar, spruce, hemlock, oak, and many other varieties. The soil varies from a sandy loam to a rich, black alluvial soil. The products embrace everything that is known to the temperate zone. The principal products at present are wheat, oats, barley, hay, prunes, apples, pears, peaches, and all varieties of vegetables. Berries of all kinds are especially prolific. For diversified farming, for fruit, stock, or poultry raising, this valley is especially adapted. The rainfall of the valley varies from 35 to 50 inches, falling on from 125 to 156 days. As in all parts of the state, the months from June to October are practically free from rain. The extremes of temperature as a rule range from 20° to 90°. Though once in the history of the country the temperature fell to zero, and 100° in the summer has been recorded, these extremes are unusual. Snow rarely falls, and when it does fall it seldom remains longer than 60 hours on the ground. Frost rarely penetrates the ground. The most delicate roses are not injured by the cold in winter. The valley is healthful and practically free from debilitating diseases. The valley is spoken of as one of the finest in the world; crops never fail and droughts are unknown.

SOUTHERN OREGON.

From a climatic point of view, Douglas, Josephine, and Jackson counties, comprising the district known as Southern Oregon, is perhaps the most delightful portion of Oregon. Here is found the mean between the heavier rainfall of the Willamette valley and of the coast districts, and the dry climate of California to the south. The annual rainfall amounts to from 20 to 35 inches in the greater portion of the district, sufficient for all crops without the aid of irrigation. The rains occur principally from November 1st to April 1st, with occasional showers in the remaining months, except in July and August; these two months are practically free from even showers. Snow occasionally falls during the winter months of January and forepart of February, but it never remains for any length of time; sleighing is an unknown luxury, save in the occasional phenomenal or exceptional year, when it has been known to last for several days. Rain falls on an average of from 100 to 130 days in the year. The temperature ranges from zero to 100°. These are the extremes, though it is seldom that a zero temperature is recorded. The lowest temperatures in winter usually range from 10° to 20° above zero, while the summer heat seldom rises above 90°. As in all portions of Oregon, no matter what the day temperature may be, the night temperature is always below 70°, and usually below 60°. This district is exceptionally healthful. Typhoid fevers are of rare occurrence, and most diseases are of mild character. Intermittent fever and malarial diseases are absent and entirely unknown. Asthma, although not prevailing to a great extent, is yet more frequently met with than in portions of the country bordering on the Atlantic coast. The soil is a rich, sandy loam; in places it is decomposed granite; in others, it verges into a black, vegetable mold, very rich and prolific. The district is essentially a fruit district, though the raising of cattle and cereals and lumbering are important interests. The principal fruits are prunes and peaches; apples, pears, and plums are extensively and profitably grown. Grapes—table and wine—are grown in abundance. Some of the best wine on the Pacific coast comes from Jackson county, about Jacksonville. Almonds, figs, peanuts, and other similar products are successfully grown. For soil that will produce excellent returns, and a climate exceptionally delightful, Southern Oregon meets expectations.

EASTERN OREGON.

The three foregoing districts are to the west of the Cascade mountains. These mountains traverse the state from north to south about 125 miles from the coast line. They divide the state into two distinct climates. To the west, for all practical purposes, irrigation is almost entirely unknown, while to the east irrigation is necessary to most all practical purposes. This is especially true in the district termed "interior counties." Portions of the Columbia river valley require irrigation, and the greater portion would be benefited by it.

THE COLUMBIA RIVER VALLEY.

This valley is at the present time a great wheat-producing section, with a portion of it devoted to fruit. Peaches, strawberries, and watermelons are usually ripe earlier in this valley than in any other section of the state. Practical experience has shown how successfully peaches can be grown in this valley, and meteorological observations have shown that the cause of this successful growth lies in the fact that the nights, during the growing season, are warmer than in any other portion of the state. This valley is rapidly becoming the famous peach section, and will be more so in future years. The winters are cold, the summers are warm. The mean minimum temperature in January, the coldest month, is 24°, while the mean maximum temperature in August, the warmest month, is 82°. Temperatures of zero are not uncommon in winter, nor are temperatures of 100° in July and August uncommon. The annual rainfall ranges from 12 to 16 inches. Snow al-

WESTERN OREGON.

This division of the state includes the counties of Clatsop, Columbia, Multnomah, Clackamas, Marion, Washington, Yamhill, Tillamook, Polk, Lincoln, Benton, Linn, and Lane. Those on the Columbia are Clatsop, Columbia, and Multnomah. Those on the Willamette river are Multnomah, Clackamas, Washington, Yamhill, Marion, Polk, Linn, Benton, and Lane. Those on the coast are Clatsop, Tillamook, Lincoln, and Lane.

THE WILLAMETTE VALLEY

Lies in this part of Oregon. It is bounded on the south by the Calapooia mountains, on the east by the Cascades, on the west by the coast range, and on the north by the Columbia river. It is the wealthiest and most thickly populated section of the state. The length of the valley is 150 miles, its average width 60 miles, not including its mountain slopes, and presents one beautiful sweep of valley containing about 5,000,000 acres, all of which is highly fertile. It is drained by the Willamette river, which runs north and empties into the Columbia. This stream is navigable 120 miles. From their sources in the Cascades flow westward the Clackamas, Pudding, Santiam, and McKenzie rivers, and empty into the Willamette. The Coast Fork is an important branch. From their sources in the coast range flow eastward the Tualatin, Yamhill, LaCreole, Luckiamute, Mary's, Long Tom, and Calapooia rivers, which also empty into the Willamette. These are all streams of importance, some of them navigable, each draining a considerable country valuable for agriculture, fruit, stock, and timber. At about the center of the valley is the Minto Pass over the Cascades, through which a railroad, whose coast terminus is Yaquina bay, in Lincoln county, is building to traverse Eastern Oregon. The elevation of the center of the valley ranges from 70 feet at base of falls of Willamette at Oregon City to 400 feet at the southern extremity. There are broad and fertile prairies separated by streams, shaded by strips of woodland, and heavy forests of timber trees cover the mountains and hilly slopes. Outside of the level prairies there is a belt of rolling land verging into hills and mountains in the higher portions, which extends entirely around the valley and constitutes a very valuable part of the country. The soil of this portion is mainly basaltic and sandstone, and of great general fertility. Its products are more diversified than those of the lower lands, and frequently exceed them in quality. These rolling or hill lands are usually covered with brush. The principal advantage of the brushy tracts are good soil, natural drainage, good water, a climate beyond the reach of malaria, an ample supply of wood for fuel and building purposes and comparative freedom from early frosts. The tract under description does not embrace all the brush lands of the valley, but includes the greater portion. There are small tracts of bushes and young trees in nearly every section, but they are isolated by stretches of prairie. The foot hill lands lie at an elevation of 500 to 2,000 feet, and vary in width between these boundaries. When cleared, the brush lands are as productive as any that exist.

Large quantities of these desirable lands, mostly wooded, lie upon the upper courses of nearly every one of the tributaries of the Willamettee. They have the advantage of drying earlier in the year than the valley lands, whereby it becomes possible to cultivate the soil to a better advantage. A greater variety of farm products can be raised in the hills, and their quality is choicer. A large extent of valuable hill land is found in Clackamas, Marion, Linn, Lane, Washington, Yamhill, Polk, and Benton counties, where on the large affluents of the Willamette room for many hundreds of settlers is found. Of these streams, the principal are the Clackamas, Molalla, Santiam, McKenzie, and Coast Fork. The last, as an example, is a fine stream flowing northward over a rocky bottom, through narrow channels, and entering the main river not far from the city of Eugene. The McKenzie flows through large tracts of unclaimed timber and railroad lands where settlement can be profitably made. Much good agricultural land lies as high as 2,500 feet, being in small isolated valleys and difficult of access. The quality of the soil is high, producing with unfailing regularity the crops possible to the latitude. They are particularly adapted to stock raising, and many thousands of acres are yet open to settlement.

The timber lands lie mainly upon the interior slopes of the inclosing mountains. The extent of the forests is prodigious, and as yet only the vaguest statements can be given as to the available quantity. Speaking generally, there is a belt of timber trees upon the western slope of the Cascades that is twenty or more miles wide and extending north and south the whole length of the range. A great part of it is inaccessible at present and will so remain until the demand for lumber justifies the investment of capital to build roads into the timber region.

SOUTHERN OREGON.

This division of the state embraces the counties of Douglas Coos, Curry, Josephine, and Jackson. It is south of the Willamette valley, from which it is separated by the Calapooia mountains, adjoins California on the south, the Siskiyou mountains lying between, with the Cascades on the east and the Pacific ocean on the west. The surface of the country is mountain, hill, and valley, every part of which is valuable. The mountains for mineral deposit, the hills for timber, grazing, and fruit culture, and the valleys for every class of agriculture possible to the temperate zone. The principal streams of this section are the Umpqua and Rogue, which pierce the Coast range and join the Pacific. Along the first named stream is the Umpqua valley, surrounded by the Calapooia mountains, the Coast range, the Cascades, and the Rogue river mountains. This is a rich grazing, agricultural, and fruit-growing section. The surface is undulating and sparsely timbered with live and white oak. The soil is exceedingly fertile, the range grasses and climate rendering it peculiarly well adapted to sheep culture and dairying. The slopes of the Cascades and Coast range are heavily timbered with fir and cedar, like the slopes around the Willamette valley.

The Rogue-river valley lies between the Siskiyou and Rogue-river mountains and the Cascades and the Coast range. The surface of the valley is level, sloping gracefully back to the Cascades and meeting the other mountains somewhat abruptly. This slope, like the Umpqua, is dotted over with white and live oak. All the lands of this valley are very fertile, the soil and climate conducing to the growth of fruit of all kinds, especially peaches and grapes. The soils of the foot hills and slopes of this valley are better adapted to fruit culture than are the valley lands. The mountains adjoining on the north, west, and south are rich in deposit of gold, which is extensively mined. The country between these valleys is embraced by Josephine county, which is principally mountainous. Along the small streams are numerous vales of great fertility, all of them producing fruit of excellent quality. This county is essentially a gold producing section. The mines are extensively worked and very remunerative. Throughout this part of Southern Oregon, and along the Rogue river, in the foot hills, are extensive forests of sugar pine, valuable for finishing lumber.

The portion of this section west of the Coast range, embracing Coos, Curry, and a portion of Douglas counties, is generally heavily timbered with fir, spruce, and cedar. Stretches of rolling land exist practically devoid of timber, producing excellent grasses for grazing purposes. The land is fertile and suitable for agriculture and all kinds of fruit. Extensive coal deposits are found, some of which are developed and yield abundantly. Coos bay is one of the best harbors on the Oregon coast. Salmon fishing is profitably pursued at the mouth of Rogue, Coquille, and Umpqua rivers.

EASTERN OREGON.

This division embraces all the state east of the Cascades from California and Nevada on the south to Washington on the north. It is in the form of a parallelogram, 275 miles long and 280 miles wide, and includes the counties of Klamath, Lake, Harney, Malheur, Crook, Grant, Baker, Wasco, Sherman, Gilliam, Morrow, Umatilla, Union, and Wallowa. This portion of the state is a plateau whose surface lies at a height above the ocean of from 2,000 to 5,000 feet. In the northeastern part of the state between the Snake and Columbia rivers are the Blue mountains whose summits are more than 6,000 feet high. The influence of the mountains is beneficial to agriculture, as their height causes a consid-

NATIVE AND IMPORTED GRASSES.

Written for New Year's Oregonian, 1898, by Professor H. T. French, Agriculturist Oregon Agricultural College, Corvallis.

Grass is the basis of all successful agricultural operations. Where grass fails to grow, or has never grown, there is little hope of securing any crop of very great agricultural value. "Grass is king among the crops of the earth. Grass is the pivotal crop of American agriculture," says George Geddes. These and many other sayings that might be mentioned point to the important place occupied by grass in the list of farm crops. Indeed, the almost unlimited fertility of the soil throughout a greater portion of Oregon is due very largely to the decay of a luxuriant growth of grass which once covered hill and dale. The older pioneers of the state will remember the abundant growth of grass which was found everywhere in an early day.

Within the state of Oregon there are found many varieties of climate, soil, geological formation, and widely varying conditions, due to precipitation, elevation, proximity to mountains, coast, etc. All these natural conditions have a marked influence upon the vegetation of the locality. To take up and discuss the numerous varieties of grasses found in the varying localities would require more space than has been allotted to me, had I the time and data to compile such a treatise. Hence I shall confine myself to those genera which are believed to be of most value from an economic point of view.

In the eastern and southern parts of the state are found the more hardy bunch grasses, which have maintained themselves in these localities for ages, furnishing an almost unlimited source of luxuriant pasturage of very high nutritive value. The pasturage of these regions is made up largely of a class of grasses noted for their ability to withstand extremes of drought, and when in a dry state furnish a source of pasturage for stock which is second to none so far as nutrition is concerned. This peculiar quality of the bunch grass is not present in the grasses of the Willamette valley, which grow more luxuriantly.

It is said that grass only attains this peculiar nutritive quality when grown 3000 feet or more above the level of the sea. This elevation includes a large portion of the eastern part of the state, where these grasses furnish such an abundance of pasturage. While this range, which was once a vast public domain, open to any one who wished to use it, is now taken up, to a large extent, and controlled by private land holders, it is none the less important as a grazing country. It is true in many places that the once flourishing bunch grass has been largely exterminated by the great flocks of close-nibbling sheep, yet it is still the principal source of food for thousands of cattle, sheep, and horses.

The most important grasses under the head of "bunch grass" are found in the following genera botanically known as *stipeæ*, *oryzopsis*, *deschampsia*, *festuca*, and *poa*. These grasses cover the finer sorts, those which furnish a short, sweet, and very nutritive pasturage. Of the coarser grasses, the *calamagrostis* furnishes several species. These are tall, stiff grasses, readily eaten by stock, very nutritious, and are commonly known under the name of blue joint. Certain species of this grass are found in mountains, valleys, and open prairies. Wherever found it furnishes an excellent pasture grass, and, when well cured, makes good hay. When the smaller grasses on the range are covered with snow, these grasses furnish sustenance which can be more easily obtained.

GRASSES VALUABLE FOR PASTURAGE AND HAY.

In the larger valleys of the state there is found a great variety of grasses, which are more or less valuable for pasturage and hay. In the western portion of the state, which receives a heavy annual rainfall, a more luxuriant but less nutritive herbage is found. In the Coast range of mountains, grasses of many kinds grow very rank, and the coarser species, those adapted to more moisture, are found in their greatest perfection. Among those very common in this region we would mention the *glyceria*, *agropyrum*, and *beckmania*.

These grasses are adapted to low, moist ground, along streams and in marshes. Wherever the underbrush is cleared away along the streams sufficient to permit the sun to send his rays to the earth, these grasses will soon make their appearance. Specimens of these grasses have been gathered from the Coast mountains which would measure more than six feet in height.

Several species of wild rye (*elymus*) are found in various parts of the state, and, while not so nutritive as some of the smaller grasses, it furnishes a large amount of pasturage, and is often cut for hay. In Eastern Oregon it grows along the dry creek bottoms, and here furnishes considerable winter pasturage when the smaller grasses are covered with snow.

Cheat or chess (*bromus*) is a very common grass grown for hay throughout a large portion of the Willamette valley. It is sown in the fall with almost as much regularity as the wheat crop, and when cut in season and well cured, makes a very fair quality of hay for horses. The average yield is from 2 to 3 tons per acre. The chief advantage of growing this grass is that it will produce a crop where other less hardy grasses would fail. Farmers are gradually learning that clovers and other grasses make a more nutritious ration, and are gradually discarding the use of cheat.

FESCUES GROWING IN FAVOR.

Festuca is a genus which covers a large number of species and varieties which are more or less valuable for pasturage and for hay. Many of these grasses are found in Oregon widely distributed. One of the species of this grass has been termed "the great bunchgrass" (*F. scabrella*). This grass is the most widely distributed of any, and is one of the most vigorous, hence its name. It grows in bunches or tussocks, which are difficult to cut with a machine. The grass is too coarse for sheep; but in Eastern Oregon it is one of the most important grasses for horses and cattle.

Sheep's fescue (*F. ovina*), which includes several varieties, is a very important pasture grass, found widely distributed throughout the state. It is found at high elevation in the mountains, and there furnishes a short, sweet pasturage for sheep and other stock. It is said to be the most wholesome and nutritious grass for sheep and cattle known. It is found growing with considerable vigor in dry, sandy soils. It is a very valuable grass to place in mixtures for permanent pastures. Its fine, short stems and leaves make a thick and firm covering over the ground.

Meadow fescue (*F. pratensis*) has been introduced into this state, and is very rapidly gaining a strong foothold. It is a very strong, vigorous grass, producing excellent pasturage, especially in fall and winter, and yields a very good quality of hay. This grass produces an abundance of seed, and on this account the seed is cheaper than that of many other desirable varieties. The soil and climate of Western Oregon are well adapted to the growth of meadow fescue. This grass occupies a very important place among the grasses used for hay and pasture in England, where a similar climate prevails to that of Western Oregon. This grass matures early, so that it might be sown with a mixture of orchard grass and clover. It will yield from 2 to 4 tons of hay per acre. It endures dry weather better than the smaller grasses. The roots of this grass run deeper into the ground than the roots of many other species.

Hard fescue (*F. duriuscula*) is a grass which, when thoroughly established, produces an excellent sod, and considerable pasturage. It is a valuable grass for pastures in the Willamette valley and on the drier hill pastures.

Red fescue (*F. rubra*) is another fescue which is worthy of extended trial for permanent pastures. It grows well during the dry season, producing a fine and very nutritious pasturage. In forming pastures which will withstand the tramping of animals, this grass should not be neglected, for it helps to form a thick, dense sod when sown with the coarser varieties.

Bunch grass (*orysopsis cuspidata*)—This is one of the bunch grasses found in the eastern part of the state. It thrives in a sandy soil, where many of the more valuable grasses would not succeed.

Glyceria furnishes several species found in this state. *G. nervata* is most important. This is called nerved meadow grass. It is found in the Coast mountains, specimens having been gathered in that region measuring over 7 feet in height. Cattle graze upon the grass both when green and when made into hay.

Bluestem (*agropyrum glaucum*)—This is another grass found in the valleys and along the streams of this state, but is not confined to these locations. It is a valuable grass for both hay and pasturage. The grass spreads by means of under-ground stems; and when set in a meadow it is a good practice to break up the roots every two or three years with a sharp harrow. The broken roots or stems take new vigor, and soon present a stronger growth than the parent plant.

The genus *panicum* is represented in this state by several species. It is not of very great value so far as the native species are concerned. They furnish sure feed for stock, however, in many of the sandy out of the way places. Grasess belonging to this genus are found most abundant in Southern states, and there furnish much valuable food for stock.

Wild oat grass (*danthonia*) is one of the many grasses found high up in the Cascades, growing on the semi-barren mountain sides. Its chief value is found in its growing where other more valuable grasses will not grow.

Tall oat grass, Lincoln grass, evergreen grass, are names given to a very valuable grass for the western portion of this state. The grass is botanically known as *arrhenatherum avenaceum*, a long name and a tall grass. This grass does well upon the more moist lands and in shady places on the hillsides. Its sends its roots deep into the ground, thus enabling it to withstand extreme dry weather. It grows all winter, in the Willamette valley, furnishing abundant pasturage. When sown with clover, and other grasses, it makes excellent hay. It matures at the same time as clover. Several farmers are now growing this grass in woodland pastures where the timber has been cleared away, but the ground has never been plowed. Under such conditions, the grass furnishes much valuable pasturage. Other finer grasses should be sown with it, to cover the ground more completely, for this grass, like many other coarse grasses, grows in tussocks.

Hair grass (*Deschampsia*)—Of this there are several species, but the most common, and probably the most important in this state, is *D. caespitosa*. This is one of the common bunch grasses found in the eastern part of the state. It grows at very high altitudes. Dr. Vasey speaks of the grass as follows: "It grows in bunches, which are firmly rooted. The culms are two to four feet high. The root leaves are very numerous, long and narrow. The panicle is very handsome, presenting a purple and glossy hue, and a loose, graceful appearance. Its culms are too light for haymaking, but the abundant root leaves may make it valuable for pasturage, especially in the arid districts."

Velvet grass (*Holcus lanatus*) mesquite—This is a grass which scarcely needs an introduction to the Oregon farmer; for it is so widely distributed it has become very well known. It is a grass introduced from Europe, but it is quite thoroughly naturalized. It is inclined to grow in bunches, and does best on low, wet land; yet it is found on all kinds of soil in Oregon. It is quite a favorite pasture grass in the red hill lands where fern abounds. It seeds readily, and withstands extremes or drought better than most grasses found in these localities. This grass has produced well, as far as we have tried it, on the white land. Its chief value lies in its power to thrive where other and better grasses fail. Hay made from this grass is inferior to that of most other grasses. It is found on the summits of the mountains near the coast and far up in the Cascades.

Agrostis—This is one of the largest and most widely distributed genera found in the state. It contributes some of the most valuable grasses found in our pastures and meadows. These grasses are commonly known under the name of red top. *A. vulgaris* is extensively used in the low meadow lands along the streams and rivers. It makes a thick sod on soft ground, thus rendering the tramping of stock less injurious. Hay produced from this grass is of excellent quality, and free from dirt or dust when well cured.

A. Stolenifera, a variety of *A. canina*, produces the best turf on white land of any grass with which we are familiar. As indicated by its name, it has the habit of spreading over the ground or stealing along the surface with its spreading culms. The culms do not grow high, but the leaves and stems furnish a good bite for sheep and cattle. This grass is well adapted to the formation of permanent pastures on the prairie lands found in the large valleys of the state.

Blue joint (*calamagrostis*)—Several species of this grass are found in this state, and they contribute very largely to the nutritive pastures found in the eastern portion of the state. Cattlemen report this grass abundant in many portions of Eastern Oregon, where it furnishes excellent feed during the fall and winter, when the finer and smaller grasses fail to produce pasturage, owing to the snow or extreme cold.

ORCHARD GRASS SPECIALLY ADAPTED.

Orchard grass (*dactylis glomerata*)—This is a grass introduced from Europe, which has become thoroughly Americanized, and is almost a native Oregonian. It probably came across the plains, or around the Horn, with the early settlers of this coast. The grass has been known in the Eastern states since an early day. The seed of orchard grass was sent back to England as early as 1764. There is no state in the Union where orchard grass does better than in Oregon. Samples of this grass, measuring over 8 feet high, were gathered by me and sent from Oregon to the World's Fair. It is found widely distributed throughout Western Oregon. It grows on the red hill land and in the valleys. It makes good posturage late in fall and early in spring. There is scarcely any grass that will withstand dry weather as this does. When cut early it is not easily excelled for hay. It makes a most excellent grass to mix with clover, for it matures at the same time. There is no reason for mourning the loss of the native grasses, when a foreigner comes in and makes itself at home, and so thoroughly adapts itself to our soil and climate. I thoroughly indorse the remarks of Mr. T. A. Cole, of Madison, New York, and believe they will apply to Oregon as forcibly as as to the East. He says: "After 20 years' experience, I have settled down upon orchard grass as possessing greater merits than any other, for pasture and meadow, for fattening animals, or for dairy stock. When cut for hay, just before bloom, and cured with as little sun as possible, it will make more milk than any other variety known to me; if left to ripen it is worthless."

BLUE GRASSES.

Poa—This genus contains a very large number of species found in Oregon. The Kentucky blue grass is the best known type of this genus. It contains grasses varying in height from 2 or 3 inches to 4 feet. It contains the earliest maturing grasses, as well as those which grow in our mild climate the entire season. The little grass (*poa annua*), found on the roadside, on gravelly walks, and on lawns, which in Oregon blooms often in March, is one of the grasses of this genus.

Kentucky blue grass (*P. pratensis*) does very well on the low beaver dam lands or along the river where there is a rich deposit of vegetable matter. On the low lands along the Willamette river, and on the Columbia river bottoms, Kentucky blue grass is found in abundance.

Another species of blue grass, known as flat-stalked meadow grass (*P. compressa*), has been very successfully grown on the low lands along the Columbia river. It is a valuable pasture grass for such localities, but is of very little value for dry land.

Poa tenuifolia is one of the bunch grasses which furnish natural pasturage in many parts of the state. This grass is very nutritious, and is readily eaten by stock of all kinds. Much more interesting data might be presented with reference to the grasses of this genus in this state, but I will be content to say that they are widely distributed throughout the state, and figure more or less prominently in her agricultural resources. They are found high up on the mountains, in the valleys, on the plains, and along the coast.

Wild oats (*avena fatua*)—While this grass is considered a weed "when out of place," it is a source of much valuable food for stock throughout portions of this state and California. If cut in season, it makes good hay, and when green makes good pasture. If permitted to go to seed, it is difficult to clear the ground of it, for the seed will remain in the ground a long time without germinating, unless the conditions are favorable.

Timothy (*phleum pratensis*)—This is one of the best known grasses in this state, as in many of the older states. Timothy finds congenial soil and climate in many parts of Oregon. It thrives best on the low black lands along the coast and in the river bottoms. Specimens of this grass 8 feet in height have been gathered in the valleys of the Coast mountains.

Foxtail grass (*alopecurus*)—A grass especially adapted to low, wet marshes and sloughs. Meadow foxtail (*A. pratensis*) is perhaps the most common species. It starts early in the spring, usually heading out early in April, in the Willamette valley. It does not cover the ground with as complete a turf as many of the smaller and finer grasses. Some species are found high up in the mountain meadows, and on account of this the grass is sometimes called mountain timothy. It makes a fair quality of hay, but the yield is light.

Rye grass (*lolium*).—Of this grass much might be said, for it seems to do especially well under our soil and climatic conditions. English rye grass (*L. perenne*) has won a place among the standard grasses for pasture in some portions of the Willamette valley. In Washington county it has been grown with flattering success. When sown in the fall it will make a crop the following year. Hay made from this grass, if cut early, is good in quality, and the yield is very satisfactory. This species has done better, as far as noticed, than *L. italicum*, although the latter makes a fair growth, but does not stand so long without reseeding. The English rye grass is a perennial.

Much more might be said regarding the grasses of Oregon, but space forbids any further discussion of this most important subject. I will only take the time to say that there are many flattering conditions favoring the growth of grasses throughout a large portion of the state. No one with an average degree of forethought and care, should be without an abundance of pasturage and hay for all kinds of farm stock.

Trifolium "the triple-leaved benefactor of mankind," has many representatives in Oregon. There are probably more than 80 named species of native clovers found in Oregon. To this list of native clover one might add red clover, (*T. pratensis*) aliske, (*T. hybridum*) and white or Dutch clover (*T. repens*). The common red clover is grown in great abundance in some counties in the Willamette valley, and no better growth could be found in any state in the Union. Farmers are learning to use it more and more, as the demand for stock raising and feeding increases. That it can be grown successfully in most parts of the state, there is little doubt. All of the country west of the Cascade range will grow clover successfully. Along the coast it grows almost spontaneously. It is not uncommon to get a yield of three tons of clover hay per acre in the Willamette valley, and this at a single cutting.

As a good indication that tame clover will succeed, I will refer to the native clovers; and as they are closely related to red clover, I believe that this "red-plumed knight" will at no distant day hold undisputed possession of the farmers' fields. Up to the present time the farmer has not seen the need of recuperating a soil of almost unlimited fertility; but ere long some means will have to be taken to bring back the waning forces; and as clover carries the key to this secret, it will have to come forth and unlock the hidden forces of the soil, setting forth elements of plant food which produce "first the blade, then the ear, after that the full corn in the ear."

Both aliske and white clover grow vigorously in the Coast range. They are found in the mountains, foothills, and along the coast. The great difficulty has been to get the seed to catch; but this is being gradually overcome, as a better state of cultivation prevails. Space will not permit a full discussion of native clovers, but no one will doubt for a moment that they are valuable forage plants; and in this state, where they are so widely distributed, they form an important factor in the natural pasturage.

Gypsum should be used as a fertilizer for clover at the rate of 75 to 100 pounds per acre. This fertilizer more than doubles the crop. As high as 200 per cent. gain in the crop has been noted from its use. The material is comparatively cheap, and easy to apply. It should be sown in winter or early spring. At present it is quoted at $12 per ton in Portland. The price is coming down each year, due to the fact that new mines are being opened and new beds discovered within our own state. This will lesson the cost of transportation and thereby enable the manufacturer to place it on the market at a less cost to the consumer. There is no better soil or climate in the United States for the growth of common red clover than that found in the Willamette valley; and with the aid of the fertilizer mentioned, there is no good reason why every farmer should not avail himself of its growth, both for stock food and as a fertilizer for the wheat fields, which are losing their native fertility.

ALFALFA.

Closely related to clover we find alfalfa, (*medacago sativa*) which is sometimes called clover. This plant thrives in many parts of the state, making an important adjunct in furnishing pasturage and hay. In Eastern and Southern Oregon it is extensively grown, both with and without irrigation. The loose, open soil of these localities is especially adapted to the growth of this plant. It does much better, of course, where water can be supplied. As high as seven tons per acre have been harvested in a single season, and this on sage brush land, which, at one time was thought to be worthless. On the heavy lands of the Willamette valley it is of doubtful value. On such land it is started with difficulty, and the growth is very slow, owing to the compact nature of the soil and subsoil.

VETCH AND WILD PEA.

A discussion of the forage plants of Oregon would not be complete without mention of the vetch and wild pea. There are several species belonging to the genera *vicia* and *lathyrus*. Both of these furnish valuable forage plants. The vetch is found in the valleys, but it is most abundant in the mountain pastures. It starts early, producing an early bite for stock, and when dry, during the latter part of the season and winter, it is readily eaten and is very nutritious. The wild pea is a valuable forage plant in both the Coast and Cascade ranges. Dairymen living near the mountains prise this feed very highly, in the production of fine butter and cheese. Some species of this plant might, no doubt, be profitably introduced on the farms which are located in the valleys and in the foothills.

Common vetch or tares (*vicia sativa*) is quite extensively grown for green feed and for silage; for both of which it is well adapted. The winter variety has done best. This plant is well adapted to the mild winters and moist climate of Western Oregon. Very large yields of excellent forage are obtained from this plant. As much as 19 tons per acre of green material has been obtained from the winter vetch. In feeding dairy cows there is hardly any forage plant grown early in the season that will compare with the vetch.

MIXTURES OF GRASSES AND CLOVERS SUCCESSFUL IN OREGON.

No. 1—For upland or gray land of the Willamette valley. Seed for one acre. Common red clover, 6 pounds; orchard grass, 8 pounds; tall oat grass, 2 pounds; English rye grass, 6 pounds.

No. 2—Common red clover, 5 pounds; orchard grass, 9 pounds; meadow fescue, 6 pounds; English rye grass, 4 pounds; alsike clover, 2 pounds.

No. 3—For low, black land. Common red clover, 4 pounds; alsike clover, 3 pounds; meadow fescue, 6 pounds; English rye grass, 5 pounds; orchard grass, 4 pounds; timothy, 2 pounds.

No. 4—For white land, where water does not stand on the surface. Common red clover, 4 pounds; alsike clover, 2 pounds; white clover, 2 pounds; orchard grass, 3 pounds; English rye grass, 4 pounds; creeping bent grass, 2 pounds; redtop, 2 pounds.

No. 5—For red hill land. Orchard grass, 8 pounds; tall oat grass, 2 pounds; meadow fescue, 4 pounds; common red clover, 2 pounds; sheep's fescue, 2 pounds.

For beaver dam land more timothy might be used, and more of the fescues. Kentucky bluegrass may also be added to the mixture when used on the black lands or along the river bottoms. Tall oat grass and meadow foxtail are not placed in the mixtures as freely as we would desire, owing to the high price at which the seed is held. The same is true of many of the fescues and redtop varieties.

With these brief and desultory notes upon the grasses and clovers herein mentioned, I will close, hoping that I may have thrown some light across the way, to guide those who are interested in Oregon's agricultural possibilities, for "the term grass is only another name for beef, mutton, bread, and clothing."

THE MINERAL RESOURCES OF OREGON.

Prepared by J. T. Batchelder, Chairman of Committee on Mines and Mining, Chamber of Commerce, Portland.

SECTION I — INTRODUCTION.

Within the boundaries of the state of Oregon there are found a large number of native mineral substances, of which the following list contains those of the greatest industrial importance, which, added to an uncertain number whose presence and quantity have not been fully ascertained, makes up the sum total of Oregon's mineral wealth. The list is necessarily imperfect, as the state government makes no direct provision for the collection of statistical or technical information, and the resume which is here presented is solely the result of private observation and research. This fact, while it explains shortcomings and imperfections, will also in some measure serve as their excuse.

The substances of which it is proposed to treat in this connection are arranged according to their present economic value, as follows: Coal, gold, iron, building stones, brick and pottery clays, quicksilver, limestone, silver, copper, platinum, and iridium, chrome iron, lead, nickel, and antimony.

To these might be added the natural cement, found at Oakland, Douglas county, which a few years since was for a short time the object of considerable enterprise, now said to be defunct; the glass sands reported to exist on several streams which flow from granite rocks; various ornamental stones, especially opals, some of which rise to the dignity of gems; the asbestos of Southern Oregon and Eastern Oregon, the fibre of which is well adapted to the uses of that substance; graphite or plumbago, found in considerable abundance in the Siskiyou range; pumice, the product of recent volcanism, used in manufacturing; manganese ore, found in Columbia county; jet, found in Clatsop; borate of lime, called ulexite, found at Chetco, Curry county, now an article of export; zinc ore, not now utilized, but destined to be abundantly produced from the mines of the Cascade range; ochre, or mineral paint, found at many places, including the bluffs at Oregon City; heavy spar (sulphate of baryta) in inexhaustible quantities in the Yank vein, Galice creek, Josephine county; various mineral waters, with which, however valuable, we have little to do in this article; lakes in the arid regions of Klamath, Lake, and Harney counties, which are exhaustless repositories of various alkaline soluble salts, which are worthy of extended notice, but concerning which we lack information. All these and doubtless many more mineral resources we have, whose prospective value is great, but of which we can at present say little for lack of discriminating and pertinent data.

Before proceeding to the consideration of the different mineral deposits, it will be pertinent in this connection to again call attention to the real and imperative need of an official and systematic provision for the collection and dissemination of information by the state government bearing upon the mineral resources. Very few people are aware of the extent of the demand for such information, both by dwellers within our borders and by outsiders. These mineral resources, which are probably unequalled in variety in any other state or territory in the United States, are already the foundation of many industries, and will lead to many others when properly developed. The whole population of the state could employ itself in quartz mining and make a good living at it; and there are other mineral resources almost as great. There exist, then, abundant reasons for calling, systematically and thoroughly, the world's attention to what the state possesses.

SECTION II — GEOGRAPHICAL AND TOPOGRAPHICAL FEATURES.

Before beginning the discussion of these elements of mineral wealth, we will recur to the salient geographical and topographical features of our state. It is usual to discuss in such a connection the geology of an ore bearing region before proceeding to describe the details of occurrence, but, in this case, the matter being destined for general circulation among people who are presumed to include individuals who may wish to inform themselves as to particular forms of mineral occurrences, it is deemed best to briefly discuss each group of occurrences by itself, or, in other words, each form of mineral wealth by itself, in order the more easily to satisfy individual curiosity. But in order to maintain a certain unity in construction, we will introduce the special discussions by calling the reader's attention to the predominant mineral bearing grounds of the state.

From a topographical point of view we can classify the mining regions very clearly. We recognize three, or perhaps four, ranges of mountains, or groups of ranges, which contain minerals of value, and we also recognize several mineral bearing tracts between them. Generally speaking, the minerals of value are found in the mountainous, or at least elevated, districts, but in Oregon some of our most important minerals are found in low valleys and often not much above tide water. But, nevertheless, there is always a connection between mountains and mineral occurrences. For example, the coal of Coos county is found in low lands, but we would know very little indeed about its geological age, the character of the enclosing rocks, and its general relations, if we did not know of its relation to the Coast range, which, in some sense, has revealed the secrets of the Oregon coal measures. The same thing is true of most mineral deposits; they may exist in abundance, but it is almost always the mountain chains which apprise us, by their upturned strata, of their existence.

In Southern Oregon we have two very important ore ranges, if the expression is allowable — the slate belt and the serpentine belt. Roughly speaking, the two are parallel and extend north and south, the slate being on the east side. More critically, the serpentine belt mainly constitutes the Rogue river mountains, which extend east and west, and branch south from the Rogue river, passing into Northern California. It covers an area, perhaps, of 10,000 square miles, and, if we consider the multiplicity of mineral species and their abundant occurrences, is undoubtedly the richest mineral bearing ground in Oregon. It contains lodes of chromic iron, of copper in its various forms, of magnetic iron in a state of remarkable purity, and of nickel, and the existence, in lodes, of platinum and iridium is strongly suspected. Of its gold and silver veins, although known to exist in the serpentine, we can only say that they have in one or two cases been found to be productive. Of minor minerals found in the serpentine there are magnesite, a magnesia carbonate of some value; brucite; noble serpentine, almost a gem stone; chrysoprase, a silica gem; talc, somewhat used in the arts, and other related minerals.

Thus far this remarkable belt of rocks, which covers a large part of Josephine and Curry counties and extends into Coos and Douglas, has not been much prospected, except by those in search of gold placer deposits, which are apt to occur at intervals along the side of running streams, whereby they have been brought from the gold bearing slates to the east. That there is ample room for numerous and important discoveries, no one can doubt. There are probably the largest and purest bodies of chrome iron and nickel ore of which the world has present knowledge; there is every probability of the discovery and exploitation of useful magnesian minerals on a great scale; there is a chance — a very important chance — of the finding of platinum metals in larger quantities than elsewhere known, and finally there are immense resources, already partly explored, of copper in exceptionally pure ores.

It was remarked that the slate belt of rocks lay to the east of the serpentine. This is true only in a certain sense, for oftentimes the slate crops apparently from beneath the serpentine, and is found along the streams which flow in deep canons, while the higher eminences are of serpentine. The slate is the gold bearing rock, par excellence, containing most of the worked or workable quartz vein deposits in Southern Oregon. The quartz region is rather extensive, including a good part of the country drained by the Rogue and the Umpqua and their tributaries, and by some is thought to be an extension of the gold quartz formation of California, which is probably the case. It extends as far north as Steamboat creek, an affluent of the North Umpqua river, in Douglas county, and westward in patches almost to the Pacific ocean. Eastward the slates dip beneath the later formations which border the Cascades on the west. Besides the gold quartz veins and the placers, the latter of which have yielded up to date, as nearly as can be ascertained, over $20,000,000, or about half the gold product of Oregon, the slates contain no other source of wealth.

Beginning near the Rogue river and continuing northward, parallel to the coast, to and beyond the Columbia, lies the mass of folded and elevated strata which forms the Coast range. It is mainly, but not exclusively, sandstone, for at several points other rocks, mainly volcanic lavas, are exposed, while at other localities the streams have eroded the later rocks, revealing the older ones in places beneath. This is equally true near Corvallis, where denudation has been extensive. The Coast range sandstones contain two important sources of mineral wealth, namely, coal and building stone.

Eastward, in the parallel range of the Cascades, whose structure is much more complex and its rocks older, we find a greater profusion of mineral wealth. There are veins and lodes carrying gold, silver, lead, copper, and zinc; there are large bodies of cinnabar or gulch silver ore which are to be worked on a large scale, and there are building stones of beauty and value. In the foot hills coal croppings are found, which give considerable promise of future value.

Still further to the east, beyond the Cascades, lies an arid plain of late volcanic origin, in whose depressions are found lakes having no outlets, which are heavily charged with solutions of useful salts, especially of sodium. Potash salts and the borates are reported from this region, and nitre is said to have been found.

Through the central portion of the state the lava formation predominates. Fully two thirds of the state is covered by the lava rocks. Miners have as yet found but two valuable substances in the lava, namely, building-stone and iron ore.

The Blue mountain region is a country of metamorphic rocks, granite and gneisses and basaltic lava. The mountain chain itself, covering a wide tract of country, and having many communicating ranges, with cañons and much rough intervening country, has its highest, ruggedest peaks of some metamorphic rock or granite, whose summits reach an altitude of perhaps 8,000 feet. At a lower level, and forming the plateau region through which the Powder and other streams flow, we find ordinary basaltic lava, constituting a part of that great igneous outflow which marks the period of the greatest volcanic activity that the world has ever witnessed. As remarked elsewhere, the basaltic rocks contain no regular vein deposits; but occasionally they are found overlaid with the detritus from older rocks carrying gold and constituting placers. Streams have in many places cut through the lava sheet, or in other places the scattered dykes of lava, and exposed the underlying metamorphic rocks, which contain the quartz veins from which the gold is derived. As we approach the higher elevations, the lava sheet ceases, and we find in its stead only occasional dykes, which grow scarcer about the mountain summits, but do not entirely cease even at the very highest peaks. In proportion as there is less lava, there are more of the metamorphic rocks exposed, which latter with granite make up the great mass of the mountain chains of Eastern Oregon. This fact is well exemplified in the

Powder river valley and the range called the Powder river or Eagle creek mountains, a range of peculiarly Alpine character, and almost unequalled for sublimity among American mountains. In their low and middle reaches the streams have deposited heavy beds of gravel, containing gold in grains, constituting placers which have been and still are worked to a small extent. The bowlders which compose a part of these deposits, and in some instances unfortunately the greater part, are granite, diorite, various kinds of volcanic rocks, and representatives of most of the metamorphic schists. At a higher elevation we find ridges of granite and mica-bearing slates, separated by enormous chasms with precipitous sides, the result of glacial action and profound faulting. Pine creek, which flows by the town of Cornucopia, passes through a gorge whose geological features are of immense interest, as illustrating the various forms of mountain-making forces. The geological history of the Eastern Oregon mountains is pretty clearly delineated here, where we have naked and steep mountain walls of vast height, the smoothed and planed surfaces due to glacial action, the beds of detritus brought down by the creek, glacial lakes scooped out of solid granite, faultscarps of several thousand feet displacement with abutting or opposing faces of granite and slate, or granite and schist, numerous dykes of trachytic and basaltic rocks, which as well as the numerous quartz veins, can be studied in exposures of hundreds and even thousands of feet in depth on the almost perpendicular sides of the cañon. There are granite dykes ramifying through the overlying mica slate; there are quartz veins penetrating the granite and slate, and faulted by trachytic kind. Thus we have a sequence in time-relation. The granite is evidently the oldest formation, but it is also evident that it was subject in movement, and became plastic subsequent to the laying down of the slate, which rests directly upon it. This plasticity, which allowed the ramifying dykes to be forced into the slate, was doubtless the result of pressure, heat, and the influence of moisture; the two former forces being correlated, and both either the resultant or the cause of the mountain elevation. The quartz veins were then formed, and as geologists think, mainly through the action of chemical solutions. That the igneous dykes are of later formation, we have the amplest evidence in the fact of their faulting the veins—a fact proved in innumerable instances, as at the Whitman mine.

Much the same structure exists throughout the mountain regions of Eastern Oregon, though nowhere shown so plainly as at Pine creek.

SECTION III—GOLD.

Gold, whose discovery along the streams of Southern and Eastern Oregon, led in the settlement and civilization of the state, and which was the first of her mineral resources to receive recognition, occurs in most if not all of the counties, but not always in workable deposits. The formations most favorable to the royal metal are the ancient ones: Schists and slates, granites and gneisses, of the world's earlier history. In these older rocks occur quartz veins in which, or in their broken-down detritus, the gold of commerce is found. The most important of gold-producing sections of Oregon are, first, the Blue mountain region, in Baker, Grant, and Union counties; second, the Rogue river valley and the adjacent country. In Southern Oregon the veins occur in slates, mainly; in Eastern Oregon they are in hornblende schist (Eureka and Excelsior mine), mica schist, granite, and slate. In the Santiam district gold is found in ancient schists in regular veins, and in an acid lava, probably rhyolite, in segregated masses, locally termed "blowouts," of enormous size, but exceedingly unreliable in tenure. Along the Coast range, wherever the streams have cut down into the old rocks underlying the sandstones, the evidences of gold appear along the stream, the older rocks giving up a portion of that metal, and some very small placers have been formed which have yielded a small amoount of metal. The "color" can be got in almost any of the innumerable streams which flow out of the range. But considering the paucity of gold-bearing rocks of this description in these mountains, it is not surprising that so little gold is found there. The same is true of the Cascade range north of Douglas county. The streams mostly run over rocks which are notoriously barren of gold, and, excepting a few of the larger rivers, such as the McKenzie and Santiam, none of them have produced any placers worthy of the name. The most extensive placer washings in Southern Oregon are the Myrtle creek mines in Douglas county, the product of which is supposed to be upwards of $80,000 per year; the Coyote creek mine, or rather succession of mines, in Josephine county; the extensive and still-productive hydraulic washings, near Waldo, in the southern part of the same county; the Sterling mine and other claims on the Applegate creek and its branches, in Jackson county, the Sterling being the largest and best fitted up placer mine in the state. The annual product of the placers of Southern Oregon varies but little, unless through the influence of wet and dry years. Their average output for many years has been probably in the neighborhood of $275,000. Some undeveloped ground of much promise still remains, and this form of mining will be carried on for a long time to come.

QUARTZ MINING IN WESTERN OREGON.

Quartz mining, which began in Western Oregon in 1860, or thereabouts, and was at first quite successful, has not in the past attained great importance nor added much to the wealth of the state. The paying mines are few, and those that have proved productive have been worked on a small scale. Certain mines of a "pockety" character occurring in Jackson county were worked early in the '60s and produced very well. Of milling leads, strictly so called, there have only been some four or five which were worked to any extent, and only two or three were known to have paid a profit. Quartz mining, therefore, has been in a backward and unsatisfactory condition in Western Oregon. The cause is not difficult to determine; it lies in the diminutive character of the mining and milling operations in the past. This condition is passing away now that experienced mining men from California, Colorado and other sections are taking hold of the properties near Ashland, Grants Pass, in the Bohemia district and other sections, and are employing improved and progressive methods, and modern machinery in their development.

GOLD IN EASTERN OREGON.

In Eastern Oregon we find a different set of conditions prevailing. Here the quartz interests take precedence over the placers, in the estimation of the inhabitants, and in the importance of the business dependent upon them. The gravel mines furnish unsteady employment to a considerable number of persons scattered throughout the foothills of the Blue mountains, the Powder River range, and their outlying spurs, in Grant, Baker, Union, and Umatilla counties. The yearly production from the placers is not far from that ascribed to Western and Southern Oregon, namely, $275,000. The greater part of this comes from placer washings of some individual importance, generally owned or worked by companies or associations of whites or Chinese, the tendency being to consolidate the mining interests.

QUARTZ MINING IN EASTERN OREGON.

The quartz mining in Eastern Oregon forms collectively one of the state's most important resources. The quartz mines are scattered over a wide territory, occurring in formations of the most dissimilar character, and represent a wide range of values. Some of them have been very productive, achieving important records. There are at present producing mines at Cornucopia, Union county, in the central portion of Baker county, and in the eastern portion of Grant county. In these districts and in others are many paying mines and promising prospects, which only require development to become also valuable producing mines. In Union county the Union-Companion employs 90 men and produces $200,000 per year. Taken all in all, this district probably gives assurances of certainty not excelled by any other in the state. The veins as a rule are large, are exceedingly well defined, and "go down" to great depth. The ore is quartz carrying more or less free gold with a considerable percentage of sulphurets. The former is saved on amalgamated plates; the latter are concentrated on vanners and then shipped to the smelting works.

West of Baker City are the important districts of Sumpter, Greenhorn, Granite Creek and others, the chief producing quartz mines being the Bonanza, with 20 stamps, producing $300,000 per year; an addition of 100 stamps is being made; 150 men are employed; the Eureka and Excelsior, with 20 stamps, produces $250,000 per year; the North Pole, 10 stamps, produces $150,000; the Baisely-Elkhorn has made an output of $125,000 per year; the Columbia, 20 stamps, produces $125,000; the Gold Hill, 10 stamps, produces $100,000. The Don Juan, the Bellevue, the White Star, and many other mines could be mentioned, if space permitted. The Conner Creek, whose history goes back a quarter of a century, having been the first productive mine in Oregon, deserves mention. This mine produces as a rule the most ordinary description of low-grade quartz, in which the gold is mainly free and the percentage of sulphurets extremely small, but occasionally large and valuable pockets of rich ore are found which contain coarse free gold, increasing the average yield enormously. Such a pocket was found in 1888 which required a year's time to extract and yielded a total of $104,000. Some of this ore was worth $2 per pound. In the Virtue district northeast of Baker City, are the Virtue mine, whic has produced over $3,000,000; the White Swan, Consolidated Virginia, Flagstaff, the Rachel, and many others.

In a review of this sort there is not space to discuss the characteristics of many mines or to enter much into detail concerning the essentials of mining and milling. This brief account may be fitly closed by calling attention to the steady increase in the production of gold in Eastern Oregon. In 1888 and for several preceding years statistics showed an average annual output of about $100,000 from quartz mines. This has gradually increased until the production from quartz mines is over $1,500,000.

CONCLUSION AS TO GOLD MINING.

The gold product of the state averaged for the five years from 1887 to 1891 $1,085,862 per annum, and from 1892 to 1896 $1,658,598 per annum. In 1897 the production was $3,500,000. This production is made up from the yield of placers and quartz mines. There is every probability that the gold production will increase steadily during the next few years, equal at least to the last five or ten years. This increase is likely to be due as much to the more systematic and extensive working of old, as to the discovery and development of new properties. Taken as a whole, the quartz mining industry of Oregon was never in so good a condition and with such promise for the future as at the present time.

SECTION IV—COAL.

It has long been a question among geologists—a question which as yet has not found a solution—as to what age the coal deposits of Oregon were to be referred. Some have classed all the more valuable coals of the northwest generally as cretaceous—a classification which is borne out by the researches of the United States Geological Survey among the coal measures of Puget Sound. But another class of geologists have regarded a large, perhaps the larger, part of the Oregon deposits as tertiary. Others profess to find in some localities, notably in Coos county, representative coal measures both of tertiary and of the cretaceous formations. Aside from the scientific interest of the question, it makes no difference what age produced them. The coals exist, they are sufficiently abundant, and there are the best reasons for expecting that future search will greatly increase the number and extent of known deposits.

Our coals are mainly lignitic in their character; that is, they contain a considerable percentage of water, generally produce a brown powder when crushed, and manifest the other characteristics of lignites. They usually contain a large proportion of ash, sometimes as high as 20%. The Oregon coals are as good as the average Pacific coast coals, and with the lately invented improvements in the application of fuel to heating and metallurgical purposes, they will prove as valuable as any coal.

The principal deposits of coal lie in the stratified rocks of the Coast range, where coal beds or indications of coal are found from the Columbia river almost to the California line. The beds are in rocks which are usually classed as tertiary; but the beds of Coos bay, where the most important and at present the only worked fields exist, lie in a formation which has by some been deemed cretaceous, as if contemporary with the very important coal measures of Puget Sound and Vancouver Island, further to the north. The sandstones of the Coast range in Oregon dip east and west away from the axis of the range, and are cut by running streams into cañons, valleys, and gulches, along many of which promising indications are found. But it happens that in many cases, especially high up in the range, the disturbances of the strata may have been so great as to preclude the finding of extensive beds in proper condition for mining. Extensive flexures of the strata have taken place; much ground has been faulted; and in many cases the existing beds have been set up on edge, as it were, whereby cheap and successful mining becomes impossible or at least very difficult. The obstacles of this nature render valueless a considerable proportion of the coals, which would otherwise become a valuable resource. It is where the strata are less disturbed that systematic and successful mining becomes possible; for example, in the lower foothill region, and in the comparatively level sections adjoining the mountainous tracts, the conditions as to the position of the strata, its undisturbed condition, etc., being usually favorable there. As might be supposed, the best mines, and indeed the only ones of present productiveness, are found in the comparatively level tracts. Of these the best known are those of Coos bay, which have produced steadily ever since the early fifties. The production in 1896 was 101,721 tons, value $294,564, and employing 254 men.

North of Coos bay there are numerous localities where coal has been found, notably on Smith river, Douglas county; on several streams in Lane and Benton, which flow into the sea; in Tillamook; and notably in Washington, Columbia, and Clatsop counties. These deposits are alike in their essential points, being moderately thick beds in sandstone or in a fine-grained silt, containing numerous fossil leaf impressions. These beds are frequently faulted at short distances; but in several localities they are unbroken, and represent a large area of apparently workable coal. This is particularly the case with the Nehalem beds, which bid fair to become of great economic importance. Perhaps none of the multifarious mineral resources of Oregon are more worthy of immediate attention and systematic development than the Nehalem coal fields. Lying as they do, adjacent to the more important towns of Oregon, and not far from navigable waters and existing and projected lines of transportation, it is an assured fact that their development will be rapid and their production very important. As the coast stands today, no other unworked coal fields in the Pacific Northwest offers such inducements for the investment of capital, with an almost certainty of early returns.

The other localities in which coal or indications of coal are found in the Coast range are very numerous but far inferior in promise to the Coos bay and Nehalem beds. Space is wanting to mention more than the names of a few representative localities. Thus, some miles to the west of Forest Grove a promising coal bed, or rather two beds, exists. In Benton county a great deal of search bestowed upon the ground resulted in uncovering some one or more beds near the Oregon Pacific railway. About the head of the south fork of the Coquille river, in Coos county, considerable bodies of coal land, only partly prospected, have been found. In Looking Glass prairie, Douglas county, coal seams are found, and in several other places in the same county. Sam's valley, Jackson county, was several years since the scene of a coal excitement.

COAL IN THE CASCADES.

Along the western foot hills of the Cascade range occur coal beds similar in nearly all respects to those of the Coast range, but less numerous and less promising. Beds of coal of an impure quality, but not by any means worthless, have been found near Lebanon, in Linn county, in Lane, and in fact in most of the counties bordering on the range. A bed at Wilhoit Springs, which has been explored to a sufficient extent to show its characteristics, will serve as a type of the whole class. It lies in a nearly horizontal position, and shows no signs of faulting or folding. It maintains a uniform thickness of over four feet of coal, and is inclosed in sandstone which is filled with carbonaceous matter and leaf impressions. Somewhat lower there occurs a stratum of pisolitic limestone, and overlying these strata and the coal is found the familiar volcanic ash, which forms so important a part of the superficial deposits all along the west side of the range. Basaltic dikes are common, and not far away the remains of a fossil sea beach can be made out. It is probable that, if cheap transporation can be had, this coal bed could be profitably worked. The quality of the coal is poor on the surface, where it is much weathered, but improves in depth It contains much ash; its water percentage is high; it does not coke, and it is rather friable. As a steam coal it might take rank somewhat above Mt. Diablo, but below that of Coos bay.

A newly discovered bed near Silverton, now being developed, is described as lying at an elevation of about 800 feet above the sea level, and within three miles of the Southern Pacific railroad, to which transportation may be cheaply had. The bed is from four to five feet in thickness, including one foot of "bone." No analyses have as yet been executed of this coal, but it undoubtedly belongs to the Western Oregon series.

EASTERN OREGON COAL.

Throughout that portion of the John Day valley where tertiary rocks are found, coal indications are numerous, and some very promising locations have been made thereupon. The comparative inaccessibility of the country, however, has debarred every effort to work them, and the same cause will undoubtedly retard their development for a long time. A railroad is imparatively necessary to open up these deposits. The quality of the coal is good—equal at least to the well known Roslyn coal, which is thought to belong to the same geological formation. These coals are emphatically steam or heating coals, "free burning," like all the Oregon coals. Other localities where coal is found are not rare in Eastern Oregon, but none are at present worked, nor are they likely to be worked very soon, with the exception of the coal bed not far from Pendleton, which has of late attracted a great deal of attention.

CHARACTER OF THE COAL.

Although much is said about the pecularities of the Oregon coals and their classification into anthracite, "semi-anthracite," bituminous, etc., it is probably true that no anthracite has ever been found in Oregon, and it is quite improbable that it ever will be found here, excepting as a result of local metamorphic action by igneous dykes. Even the slightest study of our coal-bearing strata will lead infalibly to this conclusion, inasmuch as the true anthracites do not in other countries occur in tertiary or even cretaceous rocks, which are our only coal measures. This is not absolute proof, of course, but it is a reason by an analogy so strong that it carries conviction. Not only do we not have anthracite, which contains invariably over 80% of fixed carbon, but we do not possess any known coals containing 60% of that constituent. As a rule, our coals carry less than 50%, with a considerable proportion of water, sometimes 10% or more, with ash ranging from 5% to 20%. They are, in fact, brown coal, or lignite, in nearly every case.

The principal facts which are brought out by a careful study of the occurrences of coal in Oregon—of which about 120 are known—are these: The comparatively recent period of its formation, and the consequent comparatively slight depth, as a rule, at which the beds are found, and below which it is unnecessary and unadvisable to prospect for coal; next, the lignitic character of the deposits; and, finally, their physical character as determined by their connection with or inclusion in mountain masses, the condition of the enclosing strata determining the continuity of the coal beds. It follows from this last consideration that the further the beds are removed from the center of the mountain masses, the less they are likely to be found in disturbed or contorted condition, and the more chance there is, as a rule, of finding workable deposits. From this condition, and perhaps from this alone, it follows that such comparatively undisturbed regions as the hills about Coos bay and Nehalem river are more apt to contain workable deposits than other portions of the range, especially such disturbed and dislocated regions as Benton and Lane, and the greater part of Tillamook county. Coal seekers have confined their attention largely to the rougher parts of the country, which is very proper, as it is in such regions that the exposures of the upturned strata are most numerous. But this fact, while assisting in the discovery of coal beds, diminishes the chances of their continuity. It should be remembered that the coal-bearing strata continue across the Willamette valley and appear on the western slope of the Cascades. They are covered, as is well known, with a great depth of basaltic rock, and in parts by a heavy layer of drift and by lately-formed soils. It is probably impracticable to even prospect for coal where the overlying deposits are as thick as they are known to be near Portland; but further up the valley the tertiary rocks come near or even quite to the surface and admit of examination. It is quite within the range of possibilities that coal may be found by boring in favorable places, selecting those that are remote enough from basaltic dykes to avoid the possibilities of their injurious action on the sought-for coal beds, and avoid also the annoyance of sinking the hole entirely in a volcanic rock. Probably the best results from borings of this sort would come from a careful choice of localities near the foothills of the Coast range; for example, near Corvallis, or Dallas, or Monroe, or other similarly situated town. The coal-bearing strata, once identified, ought to furnish sure guide in a search of this sort, not that the coal measures when found are sure to contain coal at that point—for they are apt to be barren over large areas—but the search need not extend further than to prove the extent or nonexistence of coal in these particular strata. Properly speaking, this prospecting is a work for the state to engage in, rather than for private individuals, since the best results could only be obtained by long continued operations, such as would be impracticable of performance by individuals or companies.

SECTION V—IRON ORE.

The iron ores of Oregon are found for the most part in basalt. At the Oswego iron mine, the property of the Oregon Iron and Steel Company, of Portland, the ore, which is a hydrated oxide of iron commonly called "bog iron ore" or "brown hematite," but know to mineralogists as limonite, appears to have been deposited in a bog or swamp which existed on the surface of the basaltic, or more precisely speaking, andesitic lava-flow, or volcanic debris, occupying a depression therein. The iron ore was deposited from solution in chalybitic spring waters through the agency of the organic matter of the swamp, in obedience to the laws of chemical reaction, with which we need not here concern ourselves. Subsequently there were other lava outflows and the ore was buried deep out of sight. Tilting of the beds took place, and we now find the ore deposited in a gently sloping bed or vein, lying upon one layer of the volcanic ash and covered by another. Remains of vegetable growth have been found in contact with the ore, a tree of good size being discovered penetrating the ore bed some years since. These evidences strongly support the theory of aqueous origin of the deposits, which is the commonly accepted theory of their formation. But, while the consensus of evidence points strongly that way, in several occurrences of these beds of limonite, the conditions seem to indicate a kind of vein formation. For example: At Rafferty's mine, near Scappoose, a bed of ore several feet thick separates layers of andesite, which have evidently been metamorphosed by the contact, in a peculiar way, the appearances not being what one would expect to find in case of a swamp deposit, but resembling the ordinary features of vein metamorphism. In the vicinity of the Oswego iron mine there are several small veins of iron ore which partake of these peculiarities, and may be examined for evidence upon the subject. It is not unlikely that the deposits may eventually be found to be veins instead of beds and produced by the same forces that gave rise to such celebrated ore deposits as the Comstock lode, the silver deposits of Leadville, and the huge fissure veins of Butte. It is questionable if the soft gray rock inclosing—or at least supporting—the ore bodies is volcanic ash at all. It rather resembles much decomposed andesite, its chemical composition supporting the theory that it is ordinary andesitic lava which has given up some of its constituents, especially iron oxide, and becomes the soft, heterogeneous mass that people are in the habit of calling volcanic ash, which it much resembles in color, in weight, and in other physical properties. It is rather curious, and tending to support this view, that the rocks inclosing an iron ore bed show progressively as the ore bed is approached a greater and greater decomposition, a removal of iron, a softening of the rock mass,—exactly the symptoms that one looks for in other vein formations, but not at all what we would expect to find in the case of an ore body formed by decomposition in water.

It is not fully known to what extent the limonite ores are developed in the Willamette region, but they have been traced from St. Helens on the north to Polk county on the south, a distance of 70 miles. The quality of the ore compares fairly with any found elsewhere, both in the percentage of metallic iron and in freedom from phosphorous and sulphur. It is probable that the average contents in iron of the deposits thus far opened, would not be less than 40% (corresponding to nearly 60% ferric oxide), while of the remainder about 15% is water. The silica is uniformly quite moderate in quantity. A sample of "hard" ore, taken from the Raffety limonite mine, at Scappoose, analyzed by the writer, gave:

Silica	1·25
Alumnia	5·27
Sulphuric acid	3·22
Phosphoric acid	0·34
Water	15·54
Sesquioxide of iron	74·46
Total	100·08

The iron ores of what may be called the "Limonite Belt" gave rise to the splendid industry of the Oregon Iron and Steel Company, at Oswego, where is located one of the finest charcoal plants in the country. This ranks as one of the greatest single industries in the state. It is likewise the most costly and exclusive mining and metallurgical institution in this state or even in the Pacific northwest, and is unfortunately now idle. The product was charcoal pig of an excellent quality, which for more than 25 years sustained a fine reputation. It was of a grade known as car-wheel iron, and supplied a good part of the local demand for cast metal. The charcoal used in the furnace was made in the neighborhood from fir wood.

SOUTHERN OREGON IRON ORES.

In Southern Oregon a single deposit of iron ore has been developed. This is the Gold Hill iron mine of Burrage & Pomeroy, which was worked by the owners some half dozen years since. It is located near Gold Hill station, Jackson county, only two miles from the railway, and is very favorably located for working. The ore is found in a persistent fissure vein, several feet in width and traceable many hundred feet in length, and has been explored to a depth of 200 or more feet. The upper portion of the vein consists of iron ore of a high grade, principally pure magnetic oxide, and samples about 55% metallic iron, with a moderate amount of phosphorus, not enough to exclude it from the category of Bessemer ore. A considerable amount of this excellent ore is in sight in the various cuts and tunnels—enough to make the mine of large prospective value. At a depth of 200 or more feet, however, the magnetic oxide shows sulphur, and the whole vein appears to change progressively from a pure oxidized ore at the surface to an ore bearing more and more sulphur, until it becomes a solid mass of iron pyrite (the sulphide of iron), which is at present regarded as of no use for iron making. This phenomenon of iron oxides changing into sulphides in depth is very common in mines of the precious metals, and oftentimes the coverings of oxides at the top (called "iron hat") is regarded as a promising feature, indicating strength and persistency of the vein below.

The only use which has yet been made of the Gold Hill iron ore is as a flux for lead smelting, the East Portland smelter having brought, in 1887, several car loads for this use, the material proving first class in every particular. Not far from this deposit of iron ore—in fact, not more than two miles away—the series of limestone deposits exists to which reference is made and descriptions given in another connection. There are, then, two of the principal requirements of successful iron smelting in the one locality, and both in quantities which, though not extensive in comparison with the great eastern deposits, still are large enough to serve as the basis of a considerable industry for many years to come. The only fuel which is accessible at Gold Hill is wood, mainly fir and pine, with oak and other hard woods. The pine and oak make excellent charcoal, as good as that with which the well known and much esteemed charcoal irons of the east are made. The woods of the Rogue river country are a much better source of charcoal than the fir of the lower Willamette valley—for example, around Oswego—bearing a greater burden in the furnace.

REFRACTORY MATERIALS.

It is worth mentioning that of the minor requirements of the process of steel making, a great deal of importance attaches to the quality of the refractory materials which are used to line the furnaces. Of late years basic materials in the form of magnesite, a carbonate of magnesia, and dolomite, the double carbonate of magnesia and lime, have come largely into use as hearth linings. Bauxite, a hydrate of alumina, has been used for this purpose. Magnesite is found, at least in small quantities, in Southern Oregon, occurring in the serpentine rocks about Cow creek, and from its well known association with the serpentine groups, it is to be expected that it will be found in sufficient quantity to be of commercial value in this state. Such substances should be earnestly looked for, and then the search may be combined with prospecting for their numerous associates in the serpentine rocks, among which are chrome iron ore, magnetic iron ore, various oxidized ores of nickel and cobalt, copper in various combinations, corundum, emery, and their relatives; and the members of the talc, steatite, and related groups, some of which are useful substances, many are ornamental stones, and one—noble serpentine—approaches the dignity of a gem.

SECTION VI—COPPER

The copper deposits of Oregon are for the most part confined to the southwestern part of the state, especially in Josephine county, where, in the great belt of serpentine which covers a large portion of the county, and to some extent in other metamorphic rocks, are found those bodies of copper ore which have placed Oregon in the front rank of possible producers of copper, while the lack of development and of systematic organized effort have not as yet enabled her to add appreciably to the world's production. We may say that so far her output has been nothing, for of the 260,000,000 of pounds of copper which the world annually produces, it is questionable if Oregon's production has averaged 1,000 pounds per year during any ten years of her history. It is now a decade since the time when Oregon was supposed to be about to step into the ranks of copper mining states, but the prophecies have not been fulfilled, and the resources which were to have been utilized still remain untouched. But at present, with the marvelous industrial activity of this decade in full vigor about us, it seems assured that these neglected resources—more sadly neglected than perhaps any other of Oregon's multifarious resources—will shortly come into use. It is hardly possible that with the extinction, or rather decreased production, of such copper mines as those of Lake Superior, Butte, Montana, and Arizona, which seems only a matter of time, the cheaply mined ores of Josephine county should escape the search of those whose business is the production of copper.

The Queen of Bronze mine, near Waldo, Josephine county, has long been regarded as the greatest and most valuable copper property in Oregon. It has been worked at times in a desultory way and some little ore extracted and shipped. This part of the country, which borders closely upon California, has two outlets—the one toward the north reaching the railway at Grants Pass, 30 miles away; the other southwesterly, a somewhat greater distance by wagon road over a high mountain pass, to Crescent City, a seaport of Northern California.

A typical copper ore deposit in serpentine presents many points of difference from the ordinary gold and silver quartz veins—differences that are likely to puzzle the inexperienced prospector. In the first place there are no walls such as we recognize ordinarily in mining. Then the deposits are short longitudinally, are usually disconnected, and do not necessarily lie in a straight line. They generally swell out in the center like a lens whence they are known as lenticular deposits. They of course come under the general designation of lode, and are subject to the legal interpretations and limitations of that term. It is quite surprising how many different ores found in serpentine have the lenticular form. Magnetic iron, chrome iron, copper ore, nickel ore, and their associates, are thus found, and all of them are by some scientists regarded as the result of segregation from the serpentine itself, which is shown by analysis to contain these minerals when in its unchanged condition.

These deposits or lodes in serpentine vary much in size. It is common in the serpentine belt to recognize lenses, or more properly nodules of ore of perhaps ten pounds or less, while on the lower Illinois river, not far from its mouth, the Monarch and Ella lodes reach a thickness of 40 feet. Copper pyrites containing from 12% to 20% of copper is the principal mineral present, existing unchanged in depth, as is common in most copper mines. Oxides and carbonates of copper constitute the croppings, another common phenomenon. It is said that a little gold is also found in the ore, which may be true, as gold and copper are frequent associates.

The belt of copper ores of which we speak extends from the Queen of Bronze westward into Curry county, the deposits continuing down the Illinois to and beyond its mouth. Within this distance there is a vast area of not less than 1,000 square miles suitable for prospecting, while still the boundaries of the copper zone are not yet made out, but may probably be extended indefinitely, or as far as the serpentine continues. This promising region is at present almost unknown.

A review of the copper prospects of Oregon would be incomplete without a detailed mention of the curious native copper of the lower foothills of the Santiam region, the chalcopyrite of the same section, the sulphides of the Eastern Oregon gold quartz mines, where the mineral is associated with iron pyrites, zinc blende, galena, etc., and finally the native copper in trap rock of Union and Baker counties. None of these constitute a resource of present or of probable permanent value to compare with the Southern Oregon mines, but they may in time become productive.

SECTION VII—CHROME.

In the same belt of magnesian rocks which contains the copper ores, are found almost exhaustless bodies of chrome iron, or chromite—the mineral which is so largely used in manufacturing as a basis of various brilliant dyes. It is an admixture of the sesquioxide of chromium with protoxide of iron, the former substance forming ordinarily about one half of the total mass. It is a heavy, black, compact rock, extremely hard and durable, and goes into commerce to a certain extent as an article of export to the centers of manufacture. People who are familiar with the quantity of available chromite in Josephine, Curry, and Douglas counties have declared that it is sufficient to supply the world's demands for many centuries. It is true that those demands are small at present, but they are sufficient to maintain a lucrative though limited trade with the California chrome ore producers, who now mine the most of the world's production. The quality of the Oregon chromite is pronounced above the average by those who have examined it, the small quantity—a few tons only—thus far marketed having come quite up to the comparatively stringent demands imposed by manufacturers, who require at least 45% sesquioxide of chromium to be present, as a rule, in the ores they purchase. This percentage is common in the Oregon ores, where even 55% is occasionally attained. Probably 50% ore can be relied on in the majority of the Oregon deposits, which makes a very good product, worth, according to the later rulings, about $15 per ton at tide-water. There is no doubt that a considerable proportion of the Southern Oregon deposits would pay to work at present, could such rates be secured; but unfortunately, the chrome trade is now in the hands of a few parties, who maintain a monopoly of this product and discourage, as far as they are [illegible] an development of new fields; and it is not to be expected that any extensive operations will be very successful under the present regime.

Elsewhere we have spoken of the curious association of minerals in the serpentine of Southern Oregon. As an example, there are the nickel mines near Riddle—ores of nickel, chrome, and magnetic iron. The chrome exists in the form of nodules of various size, ranging from pistol-bullets up to masses as large as a cook-stove, of great purity and high specific gravity. The smaller sizes, called "chrome shot," are common in Southern Josephine and on the road from Waldo to Crescent City. It is in this part of the state that the prospector for mineral treasures will find the greatest variety of ores to interest him.

SECTION VIII—PLATINUM AND IRIDIUM.

The somewhat rare metal, platinum, for which such a sudden demand has lately arisen, in connection with the electric lighting industry, that the price has for 8 years averaged two thirds as high as gold itself, is found in the placers, and, it is believed, in the lodes of Southern Oregon. Platinum is a member of the curious association of minerals in serpentine and other magnesian rocks, and the earliest discovery of the metal "in place" was in a serpentine formation in South America. Around Canyon creek, a noted gold placer locality in Douglas county, the gold washings show notable quantities of platinum, or, rather, an alloy of platinum with related metals. The proportion of this alloy to the gold which remains after panning is usually small, say 1 to 10; but sometimes it is much higher, in some instances reaching equality of weights. The alloy occurs in rounded or flattened grains, or in scales, of a whitish-gray color, and has evidently been subjected to the same grinding and polishing process as the gold itself. It is slightly heavier than gold, but the difference in specific gravity is not such as to allow of their easy separation by mechanical processes, which fact decreases the value of both the gold and the platinum. The crude platinum is an article of commerce, but its production, which depends entirely upon the production of the associated gold, has never become important or lucrative, and probably will never be, under the present conditions. If, however, systematic prospecting should reveal the existence of ores of platinum in place, or if exceptionally rich stream deposits should be found, the industry would probably take rank among the important ones of the coast. At present the total amount of platinum and iridium metals obtained yearly in Oregon is estimated at 200 ounces, worth, in the unrefined condition, about $6 per ounce.

A sample of crude platinum from Randolph, Coos county, analyzed as follows:

Platinum, per cent	52·00
Iridosmine, per cent	37·50
Gold, per cent	00·35
Iron, per cent	5·00
Copper and other impurities	4·90
Total	99·75

The substance, iridosmine, mentioned in this analysis, is an alloy of iridium and osmium, two metals of the platinum group, the former of which has also attained some commercial importance. It is the hardest of known metals, and is used for the tips of gold pens and for the bearings of certain very delicate philosophical instruments. Iridosmine is quite as widely disseminated as platinum, and is found in the Southern Oregon gold placers in the same condition as the latter metal, and the same remarks as to the occurrences, modes of production and limiting circumstances will apply equally. The iridosmine has usually commanded a price of about $2.50 per Troy ounce. The quantity annually secured in this state is about 100 ounces, which, with care in mining, might, it is judged, be increased to 1,000 ounces if we include the platinum also.

SECTION IX—NICKEL.

Perhaps the most curious and unique mineral deposit in this country is the now famous nickel mine, three miles west of Riddle station, Douglas county. This mine is, in the opinion of many, one of the most valuable mines in the state. It is a wonderful deposit, unlike any other in the world save one. Its single prototype is the nickel mine in New Caledonia, an island in the South Pacific ocean. One description will suffice for both. The country rock originally was enstatite, a magnesian silicate which, by decomposition of a certain kind, has been metamorphosed into serpentine. In the serpentine, which forms hills and mountains near Riddles, exist cavities which have become filled with nickel ore, not forming lenticular masses, but irregular and apparently shallow depressions, sometimes acres in extent. The ore is of variable richness, and is supposed to average 5% in metallic nickel. It is composed of a peculiar hydrated nickel-magnesia silicate, called garnierite, which is soft and amorphous, and of a light apple-green color. It contains, when in a state of purity, 24% of nickel. This mineral forms stains and infiltrations in the main body of the rock, and is occasionally found in masses of several pounds weight. Associated with it is a large portion of amorphous silica and magnesian derivatives, forming the bulk of the rock. The original unchanged formation of enstatite from which the serpentine was derived, is exposed in the working pits which have been sunk in the ore deposits. The associated minerals, besides garnierite, are chromite, in grains and masses; magnetite; chrysoprase, a silica gem stone; chalcedonic quartz, and various serpentine minerals.

Considering the nature of the deposit, its general accessibility as well as its known extent, it seems that the mine is intrinsically a very valuable property. It was discovered several years ago, and was at once developed by means of open cuts, no deeper workings than thirty feet being found necessary. No attempts have been made to extract and treat the ore, owing to various causes, the principal one being the presumed difficulty of extracting the metal. It has been proposed to fuse the ore along with an admixture of nickel-bearing pyrrhotite from a neighboring locality, obtaining thus a nickel matter, which would probably have to be refined elsewhere. In New Caledonia the exactly similar mines are being extensively worked, and the ore for the most part shipped to Australia and France for treatment. The operations are extensive, and are remunerative,

Regarding the future of the Oregon nickel mine, there is every reason to believe that the extension of the uses of nickel, bringing that metal more and more into demand, will cause these very valuable lodes to be worked, a consummation which will be hastened by the universal advance of metallurgical art, which invents and perfects processes as they become necessary, and will not and can not be balked by the difficulties attending any problem of ore treatment.

Meantime there is the greatest incentive to prospect for and discover other similar deposits, which there is every reason to believe exist in the great area of serpentine rocks west and northwest of Piney mountain, the seat of the great mine. Discovery has lately shown that other lodes exist not far away, which may be found to rival the parent mine in extent. There is a vast area of unexamined ground in Southern Oregon in which these and other ores are presumed to exist, and it is partly the object of this writing to call attention to the fact, especially since the increase of the demand for nickel, consequent upon the late discovery of nickel-steel, and its important and numerous uses.

SECTION X—SILVER.

Silver has never been an important native resource of our state, although there are silver mines within our borders, and the statistics of many years past annually credit Oregon with the production of a small amount of this metal, the production for the whole state averaging $50,000 per annum, according to the reports of the director of the mint. This occurred entirely in the form of the usual alloy with gold, and was not derived from any mine of particular richness in silver. It is well known that native gold invariably contains a proportion of silver, this alloyage varying in the Oregon mines from fifty-one thousandths to three hundred thousandths fine, the remainder being gold, with traces of copper, iron, etc. Ores of silver, however, are not unknown, nor in fact are they rare in Oregon, though there are but a very few instances of silver mines having been worked as yet. The most important Oregon mining history connected with the extraction of this metal relates to the Monumental mine in Grant county, which was worked several years ago. In later years a remarkable number of discoveries of silver lodes have been made, many of which promise extremely well for the future. The most important localities so far prospected are Greenhorn district, in the Blue mountains on the John Day drainage slope; the Bay Horse mine on the Snake river; certain claims on the Powder-river range, near Cornucopia, and on the Wallowa side; and the lodes on Galena creek, in the Santiam district.

The Bay Horse mine, about eight miles below Huntington, is a deposit, or more probably a series of deposits, of silver ore in quartzite. There is no regular vein, but from the richer portions of the lode ore worth over $200 per ton has been taken. A carload shipped to Denver paid $126 per ton. Copper carbonates and grey copper are abundant, and the gangue is a comparatively basic porphyry rock, the deposits being in most respects identical with the well-known and productive mines of mineral, just across the river, in Idaho.

The silver ores of Cornucopia are associated with gold to such an extent that they can better be classed as gold ores, under which head they will be discussed. In Wallowa county some promising silver ores were once found in limestone, which is very abundant in that region, but nothing of moment has been done to develop them.

The Santiam country, which is one of the most enticing of regions for the prospector, but very disappointing for the miner, has revealed some quite heavy deposits of sulphuretted ore, containing a small amount of silver, producing in many instances a low-grade ore suitable for concentrating. The chief instances of such lodes are to be found on Galena creek, and near Breitenbush, a station on the Oregon Pacific Railway, near the summit. The ores are usually galena and zinc blende in a gangue usually of quartz, but sometimes, as at the last named locality, of porphyritic rock, probably andesite. The latter fact points to a somewhat recent origin for the ores. The ore bodies are of considerable size and could be cheaply mined; water power is abundant, and transportation and supplies are cheap. It may be that the low grade of the ores will keep them for a long time out of use, but with cheaper labor there seems no sufficient reason why their concentration should not soon engage the attention of the mining community on this coast.

It will be seen by this brief and imperfect review that silver ores are quite widely diffused over our state, occurring in such diversity and in so many localities that there is every reason to believe that this form of mining will ultimately prove of high importance to the state. Without giving heed to the stories of high assays, which disfigure mining accounts in general, it is safe to assume that the average of Oregon silver ores contain as much of the precious metal as the average ores of any other state or territory, and that the ore bodies are as extensive. There are, therefore, equally as good chances for the prosecution of this valuable industry as exist elsewhere.

SECTION XI — LIMESTONE AND MARBLE.

There are in Oregon two classes of deposits of limestone, widely differing in locality and appearance and mode of occurrence. The limestones of Southern Oregon occur in lens-shaped masses imbedded in or interstratified with the same schistose rocks which contain the magnetic iron ore of Gold Hill and the quartz veins of the same region. In the neighborhood of Rock Point, on the Rogue river, several of these lenticular bodies, of various sizes, crop out upon the hills, being somewhat more durable than the surrounding rocks. The inclosing rocks are stratified, but they are as yet unclassified, although chance observers, judging by their megascopic character and by their position in regard to the gneiss formation below, have imagined that they belong to the archæan formation, which is possibly the case. From another point of view, the limestones and associated rocks are most likely carboniferous, since similar formations in Northern California containing similar lenses of limestone are known to be of that age, through the researches of Mr. Diller, of the United States Geological Survey, who has published an interesting monograph upon the subject.

An analysis of the Rock Point limestone, made by J. S. Phillips, Esq., shows as follows:

Carbonate of lime	89·4
Carbonate of magnesia	5·3
Oxide of iron	2·2
Silica	3·1
Total	100·0

Concerning the uses to which the limestone has been put, a small quantity has been burned in situ, producing lime for local wants; several thousand tons have been shipped to Portland and burned in the continuous kilns of the Portland Lime and Cement Company, in Stephens' Addition to East Portland, supplying largely the demand of Northwestern Oregon with a pure and reasonably cheap article which went into trade in competition with the San Juan article, which had previously dominated the lime business; and a small amount has been sold to the Portland lead smelters as flux, for which it is well adapted. Some large dimension blocks, quarried at Rock Point, have been used in building construction with success. It is a firm, durable stone, of pleasing color, and working up with facility into the desired shapes. It is very probable that of all the building stones of Oregon this limestone and that of the related deposits lower down Rogue river, near Grants Pass, will prove the best adapted to resisting the effects of our very damp and trying climate, which in time disintegrates all of the more porous, granular stones, like basalt, etc. The Rock Point limestone graduates into marble, as shown in the deposits near Grants Pass. Some excellent specimens of this ornamental and useful mineral have been shown from this locality. The texture of the marble is uncommonly close and solid, making it somewhat difficult to work, but assuring great durability. Different shades are procurable, mottled and veined material occuring in abundance. On Williams creek, an affluent of the Applegate, and only a few miles from the California line, there are enormous bodies of pure limestone which contain caves of wonderful extent.

Next in importance comes the limestone deposits of Baker county, the principal of which occur on Burnt river, about 8 miles above Huntington. At this point the bedded deposits—limestone and associated shales, etc.—which are very much tilted, are cut through by the river cañon, exposing the limestone to a depth of several hundred feet, and with a thickness of perhaps one hundred. The same stratum crops out in the hills to the southwest and northeast, and continues into Idaho, forming very important deposits. The stone is remarkably pure, carrying usually less than 1% of insoluble residues, including silica, and burns into first-class lime. The quantity available is, of course, very large, and lying so close to the railway, which passes along the cañon of Burnt river, the material can be cheaply transported. A spur of the railway connects the kilns with the main track, and everything is convenient for the production of lime on a large scale. As a matter of fact, the manufacture has already assumed large proportions, and is yearly increasing. This deposit is of greater purity than the Southern Oregon stone, and consequently is a more valuable source of lime; but as a building and ornamental stone, it is inferior, lacking the strength and homogeneity which distinguish the latter. It never shades into marble, and is furthermore penetrated by numerous cracks and checks which destroy its cohesiveness.

In other parts of Baker county there are lime deposits of considerable magnitude, notably the one worked by the Baker City Lime Company, about 14 miles from Baker City. Grant county contains considerable limestone. Union county is covered to a large extent with blue limestone, forming a thick bed. Its qualities are not known. Wallowa county contains immense deposits of extremely beautiful marble of all shades and grades, suitable for the most ornamental purposes, perhaps even for statuary. So beautiful are these stones that nothing but the lack of transportation keeps them out of use. The Wallowa marbles are among the finest and the best of all the building stones of Oregon beyond a doubt.

CLASS XII—BUILDING STONES.

The principal building stones of Oregon thus far worked can be conveniently classified, according to their lithological character, into volcanic rocks, sandstones, granites, and limestones. The class of volcanic rocks is the most abundant and diversified of all and being found in the neighborhood of the large towns, has accordingly been the most extensively utilized. These rocks include the andesites, the true basalts, the trachytes, and the tufas, or fragmentary rocks.

Andesite forms relatively the most important stone, if we regard the number of localities where it is quarried, as well as the amount of rock available for building purposes. This stone is familiarly known to all as the coarse gray or bluish-gray material so much used for foundations, retaining walls, paving blocks and macadam in Portland. It forms the hills upon which the city rests, and is quarried in many places in the city limits. It is generally called basalt, which is incorrect; yet the difference between it and the true basalt is but slight, consisting mainly in the species of felspar, which are characteristic components of each. The eminence known as Rocky Butte is composed of andesite, which also forms the isolated hills southward from that point as far as the well known Clackamas quarries, which are also andesite. This rock is very complex indeed, containing about 50% of silica and 15% of alumina, together with oxides of iron, lime, magnesia, soda, potash, etc. This complexity of composition renders the stone liable to decomposition in a greater degree than simpler rocks, such as sandstone. The evidences of this proneness to decay may be seen in the weathering of the exposed surfaces, the color of which arises from the setting free of metallic compounds, especially oxide of iron. The same remarks apply to basalt, with which andesite is commonly confounded. The comparatively short experience which architects have had with these rocks does not permit the question of their durability to be fully settled; but as far as can at present be told, this quality is considerably lacking. The inference is strengthened by observations upon the same rock in its natural condition, where many evidences of rapid decay are met with. One of the principal causes arises from the porosity of these and other volcanic rocks, water being likely to be absorbed, which, freezing, rends the stone. A quarry opened at Bridal Veil falls produces an exceedingly hard, coarse-grained, grayish eruptive rock, resembling trachyte, which might become important as a trimming stone, but is rather too hard to go into general use.

It will be understood, upon perusal of the introductory portion of this article, that there are inexhaustible amounts of volcanic rocks, covering most of the state and furnishing unending supplies of building material for all time to come. Perhaps the most singular in its origin of all the buildiing stones which have been offered for public use is that from Senator Lee's quarry in Polk county. This is a comparatively soft, easily worked stone, of dull gray color, resembling in appearance some gray sandstones. It is of most singular composition and origin, being composed of fragments of volcanic rocks intermingled with particles of carbonate of lime and fossil forameniferous shells. It must have originated from showers of volcanic particles which fell upon salt water and sank to the bottom, these becoming intermingled with the remains of the microscopic diatoms which are visible in the rock. Subsequent to its deposition decomposition took place, resulting as such decompositions usually do, in the production of a quantity of carbonate of lime, which was segregated and is now found occupying cavities much as do amygdules in other decomposed rocks. Its composition corresponds, there being over 25% of carbonate of lime, and the same proportion of silica, the latter being in combination with lime, oxide of iron, alumina, the alkalies, etc. This hybrid rock is at once sedimentary and eruptive in its character, and contains volcanic particles cemented with animal remains of a long past age. It works very easily, and is exceedingly well adapted to many construction purposes.

Of the extent of the andesite and basaltic stone quarrying no statistics are at present attainable, partly on account of the smallness of the scale upon which work is carried on. As might be supposed, the greater proportion of the andesite quarried is from the vicinity of Portland, where, however, only local needs are subserved. Quarries of andesite or basalt exist near almost every city and village in the state, within the lava region, and the stone is the favorite for building purposes on account of its cheapness. It is a reasonably good stone for most such purposes, being susceptible of ordinary finish, has strength to resist medium compression strains, and has a sombre yet not unpleasing appearance when in wall. Gray and blue-gray colors are commonest. The stone has no particular rift, and hence is not a favorite with stonecutters and quarrymen. It disintegrates on exposure to frost, which is the principal reason why the talus heap is the inevitable accompaniment of basalt cliffs. Basalt is a curious rock. Ugly and forbidding as the substance is, cumbering the ground with its boulders and disfiguring the farmer's fields and even his dooryard with its unsightly masses, it is yet the farmer's best friend, for it possesses within itself all the fertilizing minerals needed to keep his fields at the highest pitch of productiveness. It is a wonderful fact that this stone itself is a manure of no common qualifications and of boundless and inexhaustible quantity. The substances which exist in basalt and its relative andesite, and to a less extent in nearly all igneous rocks having a manurial value, are phosphoric acid and potash compounds, the most important fertilizers known, both of them indispensable in the upbuilding of the growing crop. A rock as complex in its structure as basalt is necessarily exceedingly susceptible to decomposition by the ordinary agencies of the sunlight, air, and water, and this proneness to decomposition, while setting free the various constituents, degrading the rock to sand and dust, and going through the changes which enable the growing plant to seize upon and absorb mineral food, are exactly the characteristics which prevent lava of this kind from being a very durable building stone, while making it a lasting and reliable fertilizer.

SANDSTONE.

Throughout the Coast range sandstones of various colors and textures are abundant, making up, in fact, the great bulk of the range. They are generally of a gray color, shading into red, and vary from a very fine granular to the coarsest conglomerate. They are generally rather soft and lacking in coherence, but some localities furnish stones of remarkable strength and evenness of texture, specimens of which have done good duty for many years in building construction. For example: In Cole's valley, Douglas county, may be seen a fireplace carved from five blocks or slabs of sandstone, which has been constantly used for thirty years, and shows little of the effects of wear, and the alternate heating and cooling to which such structures are exposed. This is a very severe test of a building stone, perhaps the severest which can be used, and few stones can withstand it. As a general rule it is an even grained sandstone which best stands the rapid alternations of temperature. Specimens of such stones from certain localities are so very perfect in their power to resist unchanged the extremes of temperature that they will remain intact even if thrown into water after being heated to a red heat. Such are found in Douglas and Coos counties. Others again fissure badly, and even fly to pieces explosively if subjected to the heat of an ordinary fire. Such are the sandstones of the quarry near Jacksonville.

Some extremely handsome sandstones occur in Coos county—blue, purple, and other showy colors being not uncommon. Blacklock's quarry near Port Orford, Curry county, yields a beautiful blue stone, apparantly durable, and well suited for the ornamental trimmings of the finest houses. It is the equal in appearance of any stone quarried on this coast, and ought to come into general use. It is used in San Francisco, where it is in considerable vogue as a trimming stone.

Along the tributaries of the Coquille river, in the Coast range, vast exposures of the most beautiful sandstones occur. Sometimes the stone is in heavy strata, twenty or more feet in thickness without a seam. Again, they lie in sheets of great lateral extension, and from an inch or less to many feet thick. Such stone is very suitable for flagging for street work, and may be had of any desired size, up to a rod square.

The most accessible of the sandstone beds are in Benton county, near Monroe, where the South Benton Mining Company have a very excellent quality of soft stone; in Douglas county, not far from Oakland; in Cole's valley, in the same county, and at various points on the seacoast, where schooners touch. The demand for such stone is small, being mainly for local consumption, no business of any magnitude having yet arisen, although there are considerable imports of Bellingham Bay sandstone, a precisely similar material for buildings, in Portland, a demand that could be filled equally well by the local sandstone quarries were they fitted up properly for the extracting and shipping of their product.

APPENDIX — MINERAL RESOURCES BY COUNTIES.

Baker—Gold in placers and veins; silver in lodes; native copper; limestone; building stone.

Benton—Coal; sandstone; andesite; gold in beach sands; iron pyrites.

Clackamas—Iron ore; yellow ochre; gold quartz; copper ore; andesite; galena; coal; mineral waters; potters' clay.

Clatsop—Coal; potters' clay; iron ore; jet.

Columbia—Iron ore: coal; salt springs; manganese ore.

Coos—Coal; gold in beach sands; stream placers and quartz lodes; platinum and iridosmine; brick clays; chrome iron; building stone.

Crook—Gold in placers.

Curry—Iron ore; gold in stream placers and beach sands; platinum and iridosmine; chrome iron; silver ores (?); coal; borate of lime; sandstone.

Douglas—Gold in lodes and placers; nickel ore; quicksilver; sandstone; copper ores; coal; salt springs; natural cement; chrome ore; platinum and iridosmine; building stone.

Grant—Gold in lodes and placers; silver ores; coal; iron ores; lead ores.

Jackson—Gold in lodes and placers; iron ore; quicksilver; mineral waters; building stones; graphite; coal; limestone; infusorial earth; antimony.

Josephine—Gold in lodes and placers; copper ores; heavy spar; limestone; marble.

Klamath—Mineral waters.

Lake—Mineral waters.

Lane—Gold in quartz and placers; limestone; zinc ore; magnetic iron ore; coal (?).

Linn—Gold in quartz and placers; copper ores; galena; zinc blende.

Malheur—Nitrate beds; alkaline salts.

Marion—Gold in quartz and placers; limestone, bog iron ore; copper ores.

Multnomah—Iron ore; andesite.

Polk—Building stones; salt springs; mineral waters; iron pyrites; limestone.

Tillamook—Gold in beach sands; coal; rock salt; iron ore; iron pyrites.

Umatilla—Gold in lodes and placers; coal; iron ore.

Union—Gold in lodes and placers; silver in lodes; hessite; ochre; native copper; building stones.

Wallowa—Gold in lodes; silver in lodes; copper; marble; limestone.

Wasco—Mineral waters.

Yamhill—Mineral waters; iron pyrites.

FISHERIES.

From the fifth annual report of H. D. McGuire, state fish and game protector.

The subjoined tabulated statistics of the salmon fishing industry of Oregon and the Columbia river have been carefully collected and compiled, and may be depended upon as an accurate and reliable exhibit of the importance and value of the salmon canning industry.

The extent and value of the fresh fish trade is also shown. There is also included statistics of allied industries, such as the salmon can factory, which furnished employment for nine months of the present year to 115 persons, the average monthly payroll amounting to $4,500, or $38,500 for the year. Also the salmon box manufacturing industry, which furnished employment to 175 persons, and other auxiliary industries that depend upon and are a part of the salmon canning business.

The canned product of the Columbia river salmon fishery this year amounted to 552,741 cases, of which 476,924 cases were packed in the spring and 75,817 cases in the fall. Of the total pack, 409,954 cases were packed on the Oregon side, and 144,777 cases on the Washington side of the river, the total value of the canned product aggregating $2,219,311. The total amount of raw fish utilized was 35,928,165 pounds, the value of which amounted to $1,259,475.32. The cannerymen paid 4 cents per pound for chinook [illegible]½ cents for steelheads, 2½ cents for bluebacks, and 1½ cents for silversides. In addition to the above, there were 5,060,160 pounds of salmon sold fresh and shipped east, the value of which was $151,804, making a grand total of 40,988,315 pounds of salmon taken from the waters of the Columbia river and its tributaries for the season of 1897, the total value of which in its raw state amounted to $1,411,279.

The salmon fisheries of the Columbia river this year gave employment to 4194 fishermen and 2277 shoremen and cannery employés, or a total of 6471 persons. Of these, 4,504 were engaged on the Oregon side and 1,967 on the Washington side of the river. The industry on the coast streams and bays furnished employment to 865 people, making a grand total of 7,336 persons employed.

The salmon canning industry on the Columbia and Willamette rivers is located in the following named counties in Oregon and Washington, viz: Clatsop, Multnomah, and Wasco counties in Oregon; Pacific and Wahkiakum counties in Washington. Twenty-three canneries were operated in the above named counties during the present year; 10 of these were operated in Clatsop county, nine at Astoria, and one at Clifton. Three factories were operated in Multnomah county; one at Portland, one at Warrendale, and one at Maple Dell. Two factories were operated in Wasco county; one at The Dalles and one at Seufert's; a total of 15 factories on the Oregon side of the river. The value of the shore property, buildings, and machinery of these 15 canneries and the allied industries connected with them aggregates $952,000.

On the Washington side of the river there were eight factories operated during the past season; one at Ilwaco and one at Chinook, both in Pacific county; the remaining six being located in the following named places in Wahkiakum county: Pillar Rock, Brookfield, Cathlamet, Waterford, Eureka, and Eagle Cliff. The shore property, buildings, and machinery of these 8 factories represent a value of $146,850; capital employed in operating them amounted to $255,000. The total value of the shore property, buildings, and machinery of the 23 factories and allied industries aggregating $1,098,850, and the cash capital employed $1,284,500.

The following is approximately the cost of material and labor utilized in packing the 552,741 cases of salmon put up on the Columbia river this season:

Tin plate	$ 254,260
Solder	59,874
Labels	69,082
Cases	69,092
Lacquer and turpentine	18,424
Fuel, acid, copper, etc.	11,168
Fish	1,259,475
Labor	221,096
Total	$ 1,962,471

Of the 15 salmon canneries located on the coast streams of the state, but 8 were operated this year. There is no doubt but the unprecedented low price of the canned product accounts for this inactivity. The aggregate output of the coast stream canneries for the season is less than it has been for a number of years, the total number of cases packed being 68,683, of the value of $221,404.

The eight factories operated on the coast rivers and bays this year are located on the following named streams: Two at Nehalem, one at Tillamook, one on the Siletz river, one at Alsea bay, one on the Siuslaw river, one at Coos bay, and one on Rogue river.

Amount and value of each species of spring pack of salmon on Oregon side of Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Chinook	296,556	$ 1,245,585
Bluebacks	11,618	464,472
Steelheads	29,481	106,131
Totals	337,655	$ 1,398,188

Amount and value of each species of spring pack of salmon on Washington side of Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Chinook	123,206	$ 516,465
Bluebacks	1,354	5,416
Steelheads	14,709	52,952
Totals	139,269	$ 574,833

Amount and value of each species of spring pack of salmon on both sides of Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Chinook	419,762	$ 1,762,000
Bluebacks	12,972	51,888
Steelheads	44,190	159,083
Totals	476,924	$ 1,972,971

Amount and value of each species of fall pack of salmon on Oregon side of Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Chinook	12,991	$ 42,221
Steelheads	1,871	6,081
Silversides	55,427	180,187
Totals	70,289	$ 228,489

Amount and value of each species of fall pack of salmon on the Washington side of Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Steelheads	85	$ 276
Silversides	5,423	17,625
Totals	5,508	$ 17,901

Amount and value of spring and fall pack of salmon on the Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Spring pack	476,924	$ 1,972,971
Fall pack	75,797	246,340
Totals	552,721	$ 2,219,311

Amount and value of entire pack of salmon on the Columbia river and Coast streams and bays for the year 1897:

Where packed.	*Number of cases*	*Value.*
Columbia river	552,721	$ 2,219,311
Coast streams and bays	68,683	221,404
Totals	621,404	$ 2,440,715

Amount and value of each species of salmon packed on the Coast streams and bays for the year 1897:

Where packed.	*Variety.*	*Number of cases.*	*Value.*
Nehalem river	Chinook	3,384	$ 10,152
Nehalem river	Silver	8,366	25,098
Siletz river	Chinook	3,510	10,530
Siletz river	Silver	5,015	15,045
Siuslaw river	Chinook	1,100	3,000
Siuslaw river	Silver	8,900	11,700
Rogue river	Chinook	15,355	61,420
Rogue river	Silver	3,653	10,959
Tillamook bay	Chinook	2,000	6,000
Tillamook bay	Silver	9,000	27,000
Alsea bay	Chinook	1,800	5,400
Alsea bay	Silver	3,200	9,600
Coos bay	Chinook	6,200	18,600
Coos bay	Silver	2,200	6,600
Totals		68,683	$ 221,404

Amount and value of each species of fish consumed locally and shipped East; also oil and fertilizer manufactured from salmon offal for 1897:

	Number of pounds.	*Value.*
Fresh salmon	5,060,160	$ 240,280
Salt salmon	930,300	46,515
Sturgeon	995,400	49,770
Smelt	677,480	26,500
Shad	450,500	16,750
Tomcod	62,000	2,480
Catfish	87,000	3,500
Salmon and mountain trout	15,000	1,500
Halibut	950,000	47,530
Cultus cod	222,250	11,010
Caviar	50,110	25,055
Redfish and groupers	5,300	265
Oysters	660,100	19,803
Clams	81,000	1,620
Fish oil	140,000	4,800
Fish fertilizer	252,000	3,800
Totals	10,639,200	$ 501,178

Amount and value of each species of fall pack of salmon on both sides of Columbia river for the year 1897:

Variety.	*Number of cases.*	*Value.*
Chinook	12,991	$ 42,221
Steelheads	1,956	6,857
Silversides	60,850	197,762
Totals	75,797	$ 246,840

Number of persons employed and amount earned by them in the salmon fisheries and allied industries on the Oregon side of the Columbia river for the year 1897:

How employed.	*Number.*	*Average rate earnings per man for season.*	*Amount earned.*
Shoremen and cannery employés	1,172	$ 156	$ 182,832
Gill nets	2,204	156	559,816
Seines	312	190	59,280
Pound nets	130	120	15,600
Steamers and sloops	43	200	8,600
Wheels	71	175	12,425
Miscellaneous	66	220	14,520
Fresh fish trade and wholesale shippers	216	180	38,880
Manufacturing salmon cans	115	360	41,400
Manufacturing boxes for canned salmon	175	170	29,750
Totals	4,504		$ 963,103

Number of persons employed and amount earned by them in salmon fisheries on the Oregon coast streams and bays for the year 1897:

How employed.	*Number.*	*Average rate earnings per man for season.*	*Amount earned.*
Shoremen and cannery employés	361	$ 73	$ 26,353
Fishermen	504	110	55,440
Totals	865		$ 81,793

Number of persons employed and amount earned by them in the salmon fisheries on the Washington side of the Columbia river for the year 1897:

How employed.	*Number.*	*Avercge rate earnings per man for season.*	*Amount earned.*
Shoremen and cannery employés	491	$ 156	$ 76,496
Gill nets	764	211	161,204
Seines	234	135	31,590
Pound nets	380	280	106,400
Steamers and sloops	18	220	3,960
Wheels	38	175	6,650
Miscellaneous	42	240	10,080
Totals	1,967		$ 396,380

Number of people employed and amount earned by them on both sides of the Columbia river for the year 1897:

How employed.	*Number.*	*Amount earned.*
Shoremen and cannery employés	2,277	$ 398,958
Fishermen	4,194	965,525
Totals	6,471	$ 1,859,483

Number of persons employed and amount earned by them in salmon fisheries on the Oregon side of the Columbia river and Oregon coast streams and bays for the year 1897:

How employed.	*Number.*	*Amount earned.*
Shoremen and cannery employés	2,105	$ 333,735
Fishermen	3,264	711,061
Totals	5,369	$ 1,044,796

Number of persons employed and amount earned by them in salmon fisheries on both sides of the Columbia river and Oregon coast streams and bays for the year 1897:

How employed.	*Number.*	*Amount earned.*
Shoremen and cannery employés	2,638	$ 420,811
Fishermen	4,698	1,020,965
Totals	7,336	$ 1,441,276

Amount and value of apparatus used in fishing on the Oregon side of the Columbia river for the year 1897:

Apparatus used.	*Number.*	*Value.*
Boats	1,179	$ 165,060
Pound nets	138	82,800
Steamers and sloops	8	12,500
Gill nets	1,202	282,470
Seines	35	26,900
Stationary wheels	22	104,000
Scow wheels	29	58,500
Dip nets	20	50
Piledrivers and scows	23	6,900
Horses used on seines	85	4,250
Total value		$ 743,430

Amount and value of apparatus used in fishing on the Washington side of the Columbia river for the year 1897:

Apparatus used.	*Number.*	*Value.*
Boats	410	$ 54,000
Pound nets	296	177,600
Steamers and sloops	6	12,000
Gill nets	430	96,750
Seines	83	41,000
Stationary wheels	14	56,000
Scow wheels	10	15,000
Piledrivers and scows	60	18,000
Horses used on seines	124	6,200
Total value		$ 476,550

Amount and value of apparatus used in fishing on both sides of the Columbia river for the year 1897:

Apparatus used.	*Number.*	*Value.*
Boats	1,589	$ 219,060
Pound nets	484	260,400
Steamers and sloops	14	24,500
Gill nets	1,632	379,220
Seines	68	67,900
Scow wheels	39	78,500
Stationary wheels	36	160,000
Dip nets	20	50
Piledrivers and scows	83	24,900
Horses used on seines	209	10,450
Total value		$ 1,219,980

Amount and value of fishing apparatus employed in the salmon industry on the coast streams and bays of Oregon for the year 1897:

Apparatus used.	*Number.*	*Value.*
Boats	256	$ 12,800
Gill nets and set nets	345	20,700
Seines	8	1,600
Launches and sloops	5	4,800
Total value		$ 39,900

Factories in operation on the Oregon coast bays and streams for the year 1897, showing where located, value of lands, buildings, and machinery, and cash capital employed:

Where located.	*Number.*	*Value of land, buildings, and machinery.*	*Cash capital employed.*
Nehalem	2	$ 18,700	$ 10,000
Siletz	1	10,000	7,500
Siuslaw	1	9,000	20,000
Rogue	1	10,000	28,000
Tillamook Bay	1	12,000	5,000
Alsea Bay	1	15,000	20,000
Coos Bay	1	7,000	10,000
Totals	8	$ 81,700	$ 100,500

Total value of lands, buildings, and machinery, and cash capital employed in the salmon fisheries of the Columbia river and coast streams and bays of Oregon for the year 1897:

Where located.	*Number.*	*Value of land, buildings, and machinery.*	*Cash capital employed.*
Columbia river	29	$1,098,350	$ 1,234,500
Oregon coast streams and bays	8	81,700	76,500
Totals	37	$1,180,050	$ 1,311,000

Factories in operation on the Columbia river, showing value of lands, buildings, and machinery, for the year 1897:

	Number.	*Value of land, buildings. and machinery.*	*Cash capital employed.*
Oregon side	15	$ 721,000	$ 642,000
Auxiliary and allied factories—			
Salmon-can	1	100,000	250,000
Salmon-box	3	125,000	70,000
Clam cannery	1	2,500	7,500
Manufacturing oil and fertilizer from salmon offal	1	3,500	10,000
Totals	21	$ 952,000	$ 979,500
Washington side	8	$ 146,350	$ 255,000
Grand totals	29	$1,098,350	$ 1,234,500

COMPARISON WITH OTHER STATES.

A comparative statement of the value of the product of our fisheries, number of people employed, and state appropriations therefor, with that of other states:—

The product of the fisheries of Oregon for the year 1895 amounted to $2,898,630, and if the north shore of the Columbia is included (much of which is tributary to Oregon) the total value of the output aggregated $3,959,150.

Our fisheries furnished employment to an industrial army of 5,369 persons, and if those engaged on the north shore are added the number is swelled to 7,336, to whom is paid annually upwards of $1,250,000.

The total state appropriation for the preservation and protection of this valuable industry for the past five years has been only $2,500 annually.

I have looked up the statistics of the fisheries of the different states, and find that we possess the most valuable and important commercial inland fisheries in the United States, and yet we have the poorest laws for their protection and preservation, and an appropriation so small in comparison with that of other states as to seem ridiculous.

Just compare the value of our fisheries and the appropriation therefor with that of other states. New York's annual value of product (mostly shell) is $2,700,000; appropriation for protection and preservation, which includes hatcheries, $109,000 annually; number of men employed not given, but certainly less than Oregon.

Michigan statistics, 1895, show value of product $963,778; number of people employed, 8,997; appropriation for protection and preservation, $27,500 annually.

Wisconsin, value of product $1,015,595; number of people employed, 1,510; appropriation for protection and preservation, $20,000.

California, value of product (including deep-sea fisheries, whale, etc.), $2,500,000; number of people employed, 5,000; annual appropriation, $22,500.

Minnesota, value of product (estimated), $500,000; number of people employed not known (no statistics); appropriation annually, $25,000.

And so on through the whole list, many inland states with no commercial fisheries at all making larger appropriations for the protection and preservation of its game fish than does Oregon for the perpetuation of the greatest and most valuable commercial inland fishery in the United States.

OYSTERS.

The oyster industry of the state is at present confined to Yaquina bay, and is of small proportions. The native oyster of this bay is noted for its excellent flavor, and brings a higher price than the native oysters of Puget Sound or Gray's Harbor. From June 15, 1896, to June 15, 1897, there were shipped from Yaquina 1,406 sacks of oysters, which brought the oystermen $3 per sack, or a total of $4,218, most of the output going to San Francisco.

If we can successfully introduce and cultivate the eastern oyster, the value of the industry would soon be increased a thousand fold.

EASTERN OYSTERS.

Through an application to the national fish commission filed by this office in July, 1896, there were planted on oyster flats at Yaquina bay on November 7 of the same year, 25 barrels of eastern oysters. After the work was finished I placed the planted bed in charge of Mr. George King, who has looked after the protection of the oysters and made examinations and reports to this office as to their condition from time to time. On November 12, 1897, Mr. King made a very encouraging report after an examination of the planted beds. He said he made a thorough examination of the plant and found the oysters in excellent condition in every respect, only about 6 per cent. having died, which loss was caused by injury through handling and shipping. All of the shells are covered with spat but it will be impossible, in the opinion of Mr. King, to determine positively before spring whether the spat is from the spawn of the eastern or our own native oyster. However this may be, several important facts bearing upon the culture of the eastern oyster in our waters have been established: *First*, they will and have spawned; *second*, the seed oysters planted in our waters grow and thrive; *third*, of the two varieties planted last fall at Yaquina, those from Princess bay—a round compact shaped oyster—have made a much larger growth with less loss from handling than the long irregular shaped oyster from East River. This knowledge will be of great value as a guide in selecting for future importations. Spring, summer, and winter temperatures of our waters have been secured, which will also be of value in future work along this line.

Prof. F. L. Washburn, of the state university at Eugene, has been placed in charge of the matter of observation and experiment in the development and growth of the planted beds of eastern oysters in Oregon, by the national fish commission. He will be able to state definitely, during the summer of 1898, what success will attend this venture

THE WORLD'S GREATEST TIMBER BELT.

Published in the Oregonian, January 1, 1898.

The greatest timber belt in the world is in the counties of Clatsop, Washington, Columbia, and Tillamook, in Northwestern Oregon. In the four counties there are 1,884,960 acres, containing 56,149,200,000 feet of timber. The standing timber is worth on the average 50 cents per 1,000 feet, board measure, or $28,074,600. Manufactured into rough lumber, it is worth, at the rate of $7 per 1,000, the enormous sum of $393,017,400.

Clatsop county has about 530,000 acres of timber land, averaging 35,000 feet per acre, making a total of 18,550,000,000 feet.

Tillamook county has about 700,000 acres, which will average 35,000 feet to the acre, making a total of 24,500,000,000 feet.

Washington county has about 264,960 acres, which will average 20,000 feet to the acre, making a total of 5,299,900,000 feet.

Columbia county has about 390,000 acres which will average 20,000 feet to the acre, making a total of 7,800,000,000 feet.

The foregoing totals of 1,884,960 acres of timber land and 56,149,200,000 feet of standing timber are conservative. The majority of people who figure on Oregon's available timber supply base their calculations on an average of 40,000 feet per acre. The average value of 50 cents per 1,000 feet for standing timber is reasonable. Present prices of stumpage in the Oregon timber belt are from 50 cents to $1 per 1,000. Government forestry experts have placed the average for Oregon at 62 cents per 1,000 feet.

The principal rivers in the timber belt are the Nehalem, the Wilson, and the Trask.

Along the Nehalem are 570,300 acres, averaging 40,000 feet, making a total of 22,812,000,000 feet. Along the Wilson are 116,640 acres, averaging 35,000 feet, making a total of 3,907,400,000 feet. Along the Trask are 102,400 acres, averaging 40,000 feet, making a total of 3,584,000,000 feet.

The timber in the belt consists of fir, cedar, hemlock, spruce, and larch. The fir is the genuine yellow or Douglas fir. It constitutes 8% of the entire growth. Timber in the belt is less subject to fire than timber in any other section in Oregon. This is because the lands slope toward the ocean, and the heavy fogs which prevail in summer keep the leaves and underbrush so damp that fires cannot take hold.

LUMBER CUT.

The saw mills of Oregon cut 549,823,179 feet of lumber last year. By counties the cut was:

Baker	30,000,000
Benton	1,000,000
Clackamas	4,000,000
Clatsop	28,000,000
Columbia	18,176,000
Coos	22,000,000
Crook	1,500,000
Curry	400,000
Douglas	35,000,000
Gilliam	1,000,000
Grant	400,000
Harney	2,000,000
Jackson	27,500,000
Josephine	15,000,000
Klamath	22,000,000
Lake	900,000
Lane	15,000,000
Lincoln	2,000,000
Linn	20,000,000
Malheur	500,000
Marion	2,455,300
Morrow	850,000
Multnomah	130,000,000
Polk	7,415,879
Sherman	------------
Tillamook	22,000,000
Umatilla	100,000
Union	24,500,000
Wallowa	926,000
Wasco	2,500,000
Washington	12,000,000
Yamhill	600.000

FOREST TREES

OF ECONOMICAL VALUE FOR WOODS OF COMMERCE OR FOR SHADE.

By Thomas Condon, professor of botany in the state university of Oregon, and state geologist.

There are two directions in which economical botany may find with the public special interest: one, the need of timber for commerce, and in manufacture; the other, the home demands for shade trees and landscape gardening. For both of these lines of demand, that Oregon is well endowed may be seen in even a brief enumeration of the native trees suitable for these objects.

THE PINES.

Beginning with the demands of our market, we place first on our list of timber the pines. The principal of these is the sugar pine (*Pinus lambertiana*). It is at home along the northern slopes of the Siskiyous, is fairly abundant along the line of the Oregon and California railroad near Grants Pass. It is also very fine and very abundant on the foothills of the Cascades that overlook Klamath marsh. The timber is not inferior to that of the white pine of the eastern slope of the continent. The tree is large, often growing to a height of 150 to 175 feet. It bears a large cone, often 15 to 17 inches in length, suspended from the extremities of the limbs, and therefore scattering. The timber of this sugar pine is highly prized for finishing, scarcely distinguishable from the best eastern white pine.

Another pine, the *Pinus ponderosa* (Oregon yellow pine), flourishes in many regions; a good marketable timber in and out of Oregon. It is abundant in Central Oregon from The Dalles along the eastern slopes and foothills of the Cascade mountains and southward into Lake county. It is met with seldom in the Willamette valley and is there of inferior quality for timber. Farther south one meets it more frequently. It is quite abundant on the eastern slopes of the Cascades throughout Oregon and Washington, and in many places is so fine a timber that its boards are equal to the best on any market. The supply of this timber in Eastern Oregon is very great.

Pinus contorta (black pine) is abundant along the coast, along the eastern slopes of the Cascades, and on the more elevated of the plains beyond. It is a small tree, used for fuel, but is of very little value for timber or for dressed lumber.

Pinus tuberculata (tuberculated pine) is only found on the mountains, is a small tree of but little economical value. It is remarkable for its habit of retaining all of its old cones attached to the body of the tree. Small groves of this tree may be seen on the upper slopes of the Siskiyous and in many places on the Cascades. It rarely reaches the height of 60 feet; its cones, 6 inches long, never open of their own accord to show their seeds, as do other pine cones.

Pinus muricata and *Pinus sabiniana* are rarely found in Oregon.

THE SPRUCES.

A good deal of confusion of names has fallen on this group of trees, not only in the popular names they have received, but in the scientific as well. The American railroad surveys in their reports of our forestry named the trees of this group having pendant cones. *Abies*, and those bearing upright cones, *Picea*. The popular names spruce and fir make their synonyms. The popular maintenance of this distinction became easy. Inasmuch as a popular description of their place in economical botany is what is here attempted, we will retain this distinction of the railroad surveys and call those bearing pendant cones, spruce; all bearing upright cones, fir; the former *abies*, the latter *picea*.

1. *Abies Douglasii* (Douglas spruce). Popularly, and especially in the lumber market, this ought to be called, Douglas spruce. In Oregon and Washington we have it in two varieties—"red fir" and "yellow fir." The yellow is a fine grained wood, and its boards are often as smooth as pine, while the red variety is more stiff and splintery. But red or yellow, this fir is one of the grandest trees of the continent, and one of the most important to commerce. For spars, for bridges, or for framing for buildings, its strength and great length make it the first in the market. Its great abundance and rapid growth ensure a long continued supply. Douglas spruce will raise more commercial timber to the acre than any other tree on the continent.

2. *Abies Menziesii* (Menzies spruce, or tide land spruce). This fine forest tree is seen in its best condition along the coast, where it often reaches the height of 100 feet or more. Its lumber is soft and heavy and course, but is so tasteless and odorless that it is found to be the best material for barrels and boxes for packing, and for these purposes is now finding a wide market. It is a handsome ornamental tree and easily transplanted.

3. *Abies Canadensis; Tsuga Canadense.* (Hemlock Spruce.) In any country less favored in commercial timber the hemlock of our mountains, or that of our coast, would rank

well. It reaches its finest growth in Tillamook county. The young trees are graceful ornaments in landscape gardening, and are easily transplanted.

4. *Abies Williamsonii.* (Williamson's spruce.) A handsome tree of elevated mountain habits, and so out of reach of present commercial demands. All these spruces have pendant cones.

THE PICEAS—FIRS.

The cones are upright, and in the distance they are sometimes mistaken for birds perched on the limbs.

1. *Picea grandis* (western balsam fir), or *Abies grandis* (Oregon white fir). This tree is found at its best along the banks of the Willamette river and its tributaries, but is widely dispersed along the mountain slopes of both ranges. Its commercial value falls below that of several other trees. It is conspicuous along our river bottoms for height and beauty. It is easily transplanted.

2. *Picea nobilis.* (Noble fir.) This fine fir is at home in places remote from mills and railroad lines, and therefore does not figure much in commerce. Extensive groves of it may be seen among the Coast mountains where prostrate trees 200 feet in length are not rare. As an ornamental tree it well deserves its name of noble, and is easily transplanted. It also has a large, handsome cone.

3. *Picea amabilis.* Cones are dark purple. This, too, is out of the reach of commerce; abundant along the summit of the Cascade mountains. This also is a very handsome tree for landscape gardening.

CEDARS.

1. *Thuga gigantea; Western arborvitea.* This is the white cedar of North Oregon and of Washington. It is a grand specimen of the forest tree; is durable, easily worked as finishing lumber and highly prized for its lightness. The northern Indians build their largest canoes of it, and use its bark for mats and cordage. In the southern portion of the Willamette valley it is called the smooth-barked cedar, to distinguish it from *Librocedrus*.

2. *Librocedrus decurrens.* (Rough-bark cedar or Incense cedar.) As a tree for lumber this is inferior to the *Thuga.* It does not grow farther north than Lane County. It is abundant throughout Douglas and Jackson Counties.

3. *Cupresseos lawsonina* (cypress), *Chamaecyparis lawsoniana* (Port Orford cedar). This tree is not found north of the Umpqua river. It is at its best around Coos bay and the Coquille river and the north slopes of the Siskiyous. It is called white cedar; is shipped extensively for the California market. So completely marketable is this tree that one may see on the Coquille the finest example of lumber economy. The log is cut into boards and squared timber, the slabs into pieces for broom handles and lath, and the scraps into blocks for matches; and it deserves this fine economy of material. As a tree for landscape gardening it is questionable whether North America has a finer tree than the Port Orford cedar. It is at its best along the northern slopes of the Siskiyous. It is easily transplanted, and will grow in a wide range of climate, and will teach any one to love a tree.

JUNIPERS.

Juniperus occidentallis. In many of the drier regions of Central Oregon this juniper, under the name of cedar, furnishes the chief and often the only supply of firewood. It is not abundant enough for extensive commercial demands. It strongly resembles the red cedar of the Eastern States—*Juniperus Virgianianus.*

Juniperus communis. A stranger to this species seeing it for the first time experiences marked surprise. It is entirely prostrate, often growing over a space 100 feet square, the stem 5 or 6 inches in thickness. One could readily imagine many situations in landscape gardening in which such a plant would fill a want. It is often met on the coast.

THE OREGON YEW.

Taxas brevifolia. The Oregon yew has a dense, durable wood, often used in Western Oregon for fence posts. It is not abundant enough for commercial purposes. It is a handsome tree, pays for transplanting in the beauty it adds to a lawn.

THE OREGON LARCH.

Larix Occidentallis. (Western larch.) This is a much larger tree than the tamarack of the Eastern States. Its timber is good. It is at home along a belt of foothills from the Upper Des Chutes north into Washington territory and abundant in the Blue mountains, but not in Western Oregon. Except this larch, all the foregoing trees are evergreen.

We will now consider the deciduous trees that rank as valuable for shade or ornament, as for commerce. Oregon has three oaks that are of commercial importance. Of these, in abundance and quality, the Oregon white oak ranks first.

THE OREGON OAKS.

1. *Quercus Garryana.* (Oregon white oak.) This seems at its best in the Willamette valley and along the Columbia river. For years past a large amount of this timber has been shipped to San Francisco, and well authenticated cases have occurred of its being returned to Oregon as Eastern oak, for our wagon builders.

2. *Quercus Kelloggii.* (Black oak; Kellogg's oak.) This handsome oak is found no farther north than Lane County, but grows abundant in Southern Oregon. I have not seen it in Central Oregon. It is at its best in Douglas and Jackson counties. It is a much handsomer tree than the white oak, but its timber is not so good.

8. *Quercus Chrysolepis.* (Live oak.) This tree is often used for wagon timber along the western slopes of the Siskiyous, but is scarcely abundant enough to more than supply the home want.

FOREST TREES

WHOSE TIMBERS HAVE SPECIAL FITNESS FOR THE CABINET SHOP.

THE OREGON BROAD-LEAVED MAPLE.

1. *Acer macrophyllum.* (Oregon broad-leaved maple.) The wood of this tree is dense and handsome, polishing well, with a rich variety of grain. For household furniture it is a valuable material. As a shade tree it is superior. It grows rapidly, transplants easily, and if left to itself forms a handsome head.

Acer circinatum. (Vine maple.) As its name indicates, it is too small for anything larger than barrel hoops, for which purpose it is sometimes sent to San Francisco.

OREGON ASH.

2. *Fraxinus Oregana.* (Oregon ash.) This ash is abundant along the streams of Western Oregon, sufficiently so to give it a place as a wood of commerce. Specimens of it may be seen in our cabinet shops that will vindicate this claim. The United States custom house at Portland is finished inside with Oregon ash. It loves moist places, and is on this account not suitable for shade or ornament.

OREGON ALDER.

8. *Alnus Oregana.* (Oregon alder.) The Oregon alder is abundant along the stream beds and other damp places. So marked is its love for springs and streams that the presence of a clump of these alders will often reveal to the thirsty explorer a spring of water. Its trunk is often 2 feet through. Its wood is often used in our cabinet shops, where it is prized for inside work, such as drawers.

OREGON MYRTLE.

5. *Oreodaphne Californica.* (Oregon myrtle; California laurel.) This handsome fragrant tree is abundant along the Umpqua river and through the Rogue River valley. It is at its best around Coos bay, whence it is shipped to San Francisco. As it is so heavy that it will not float in water, it is difficult to bring this wood to market. It is durable and is susceptible of a fine polish, and in every respect is a wood to be prized in commerce. As an ornamental tree it is highly valued, but is difficult to transplant. Its fruit is fairly abundant, and may be raised from the seed.

THE OREGON LAUREL.

5. *Madrona, Arbutus Menziesii.* (Oregon laurel.) The madrona is frequent in Jackson County and occasionally in the Willamette valley. For purposes of commerce it is not abundant enough, but for limited home supply it is a handsome, dense, close-grained wood that bears a good polish and is durable. As an addition to the lawn or door-yard it is a real ornament, resembling the European laurel.

THE DOGWOOD.

6. *Cornus Nuttalli.* (Dogwood.) This tree is ordinarily too small and too seldom met to be of any importance to Oregon commerce. But its wood is a very handsome one for furniture or parts of furniture requiring narrow boards. It often grows to be 12 or 15 inches through and is capable of a high polish. In all respects it is a fine wood for the turning lathe.

THE COTTONWOOD.

7. *Populus trichocarpa*; *Populus balsamifera.* (Cottonwood.) This tree is very abundant along the rivers and smaller streams and often reaches a large size. Recent experiments in making paper from the fibers of this wood have been so successful that there is but little doubt of its future importance. This wood is soft and its fiber so silky as to insure the best results for paper making.

WILD CHERRY.

8. *Cerasus Mollis, Prunus emarginata* (variety *Mollis*). (Wild cherry.) In the Willamette valley this tree is often in small groves of slender, straight forms, 8 to 10 inches through; more seldom one finds a single tree 12 to 18 inches through. Its wood is a handsome, smooth material for furniture. In the Coast mountains it is often seen in groves of considerable extent of long, straight and slender poles.

AGRICULTURE.

Oregon affords a vast area of farming lands, the best conditions to warrant the production of heavy crops, and a climate above all others, enabling the husbandman to work outdoors at something every month of the year. There is but little land in this vast region that is not good for something, being adapted to either wheat, barley, oats, hay, hops, pasture, vegetables, fruits, timber, or mining. In many sections the grass is green the year round. The farmer can seed all the fall until Christmas, or all the spring from February to May. Harvest is continued just as long as the grain will stand.

WHEAT YIELD OF 1897.

Published in the Oregonian January 1, 1898.

The wheat yield of Oregon last year was 20,318,367 bushels, the largest in the history of the state. By counties the production was as follows:

Baker	200,000
Benton	631,000
Clackamas	200,000
Clatsop	3,500
Columbia	12,000
Coos	11,000
Crook	100,000
Curry	1,200
Douglas	300,000
Gilliam	1,250,000
Grant	54,201
Harney	5,000

Jackson	250,000
Josephine	15,000
Klamath	51,784
Lake	27,812
Lane	734,500
Lincoln	700
Linn	1,400,000
Malheur	10,000
Marion	700,000
Morrow	900,000
Multnomah	8,000
Polk	1,467,820
Sherman	2,500,000
Tillamook	850
Umatilla	4,500,000
Union	1,875,000
Wallowa	160,000
Wasco	1,300,000
Washington	650,000
Yamhill	1,000,000

Portland is the natural market for all this wheat. Eastern and Western Oregon wheat was quoted at 77 and 78½ cents per bushel in the Portland market on December 24, 1897. The average price was 77¾ cents. The wheat crop of 1897, credited to geographical divisions, and appraised at 77¾ cents per bushel, was as follows:

Eastern Oregon, 12,933,797 bushels, at 77¾ cents	$10,056,027 16¾
Western Oregon, 7,384,570 bushels, at 77¾ cents	5,741,503 17½
Total	$15,797,530 34¼

The prevailing high price of wheat has put the farmers of Oregon in good circumstances. As a result, many mortgages have been paid off in all sections of the state, and the thrifty farmer is buying new machinery and making many improvements on his property.

BARLEY AND RYE.

Last year Oregon produced 1,546,888 bushels of barley and rye, as follows:

Baker	80,000
Benton	20,000
Clackamas	18,000
Clatsop	2,200
Columbia	700
Coos	14,000
Crook	50,000
Curry	5,000
Douglas	20,000
Gilliam	105,000
Grant	22,780
Harney	8,000
Jackson	40,000
Josephine	4,525
Klamath	25,000
Lake	63,958
Lane	25,000
Lincoln	40
Linn	10,000
Malheur	40,000
Marion	50,000
Morrow	140,000
Multnomah	2,000

Polk	28,965
*Sherman	—
Tillamook	1,100
Umatilla	200,000
Union	325,000
Wallowa	80,000
Wasco	150,000
Washington	20,000
*Yamhill	—

*Included in oats.

THE OAT CROP.

Oregon's oat crop last year was 6,658,073 bushels, credited to the several counties as follows:

Baker	150,000
Benton	198,500
Clackamas	600,000
Clatsop	11,000
Columbia	25,000
Coos	25,000
Crook	40,000
Curry	20,000
Douglas	400,000
Gilliam	30,000
Grant	20,654
Harney	4,000
Jackson	30,000
Josephine	25,000
Klamath	28,000
Lake	5,562
Lane	650,000
Lincoln	20,000
Linn	800,000
Malheur	20,000
Marion	900,000
Morrow	25,000
Multnomah	60,000
Polk	630,507
Sherman	200,000
Tillamook	1,950
Umatilla	75,000
Union	425,000
Wallowa	100,000
Wasco	60,000
Washington	450,000
Yamhill	628,000

Oats were quoted at an average of 34½ cents a bushel in the Portland market on December 24, 1897. At this price the value of the oat crop is $2,107,034.85.

OREGON'S HAY CROP.

Last year Oregon raised 1,114,433 tons of hay, as follows:

Baker	50,000
Benton	17,000
Clackamas	30,000
Clatsop	9,000
Columbia	12,000
Coos	18,000
Crook	50,000
Curry	12,000

Douglas	100,000
Gilliam	18,000
Grant	32,096
Harney	100,000
Jackson	50,000
Josephine	10,000
Klamath	80,000
Lake	100,000
Lane	50,000
Lincoln	4,000
Linn	59,000
Malheur	35,000
Marion	85,000
Morrow	29,000
Multnomah	16,000
Polk	20,837
Sherman	8,000
Tillamook	17,500
Umatilla	50,000
Union	80,000
Wallowa	25,000
Wasco	10,000
Washington	40,000
Yamhill	20,000

It is difficult to put a value on the hay crop, as the largest percentage of it is kept on the farms and ranches and fed to the millions of sheep, horses, and cattle. In Portland the hay would be worth, at the very lowest calculation, $10 per ton, or $11,144,830.

YIELD OF POTATOES.

Oregon's crop of potatoes in 1897 was 4,457,601 bushels, as follows:

Baker	200,000
Benton	500,000
Clackamas	500,000
Clatsop	54,000
Columbia	65,060
Coos	95,000
Crook	50,000
Curry	30,000
Douglas	50,000
Gilliam	25,000
Grant	50,000
Harney	5,000
Jackson	10,000
Josephine	30,000
Klamath	14,000
Lake	17,000
Lane	200,000
Lincoln	40,000
Linn	216,000
Malheur	20,000
Marion	600,000
Morrow	35,000
Multnomah	300,000
Polk	245,601
Sherman	85,000
Tillamook	56,000
Umatilla	125,000
Union	215,000
Wallowa	75,000

Wasco	100,000
Washington	400,000
Yamhill	100,000

HOP YIELD.

The principal hop-producing counties in Oregon are given in the following table, together with the acreage and yield in bales of 180 pounds each:

Counties.	*Acreage.*	*Bales.*
Benton	400	1,500
Clackamas	1,300	5,500
Crook	10	40
Clatsop	60	250
Douglas	310	1,300
Josephine	250	1,000
Lane	830	3,500
Linn	400	2,000
Lincoln	25	150
Marion	6,200	25,000
Polk	5,000	20,000
Yamhill	725	3,100
Washington	250	1,000
Totals	15,760	64,340

The foregoing estimates are made from the best information obtainable

FLAX AS A CROP.

By Mrs. Wm. P. Lord, Salem, President Oregon Women's Flax Fiber Association.

Amongst the resources of Oregon the production of flax fiber promises to become an important feature. The conditions of soil, climate, and water, combine in offering great inducements to flax farmers. The mild equable spring weather usually forces the bloom from early flowering plants, both wild and cultivated, by the fifteenth of February. The ground, well stored with water from the winter rains, is, if fall plowed, then in condition for putting in order for a flax crop, which can ordinarly be sowed by the middle of March or first of April. No violent storms of rain and hail meet the growing crop and pelt it back into the earth. As the season advances warm sunshiny days, often showery, but with glints of sunlight behind the clouds, give just the moisture the growing crop prefers. The days are warm, but not enervating, and the nights cool, sufficiently so as to retard the plant growth and give the firm stand in the ground that its long tap root requires to support the tall, straight stem. Wiry and tough, it grows with a rapidity, as the warmer days of June bring it to maturity, that is astonishing. In ninety days, from time of planting, the crop is ready for the pulling, which brings the work of harvesting at the last of June—just in time to be out of the way of crops requiring attention. Here the work of the flax farmer should end,—with straw delivered to scutcher,—as on the careful and almost scientific care of the straw its value as fiber depends.

But in considering the crop we must speak of the watering, and here we find unusual facilities. Brooks, natural ponds, rivers, swift running and slow running, are rioting prodigally, and the water is soft and limpid, without a trace of mineral substance to harden the fiber. From six to ten days was the time required the past season. This rapid retting leaves straw with good color, requiring less work in the bleaching. This same soft water will be an important factor in the bleaching of the linens which will be manufactured here. Oregon fiber, grown by an Oregon farmer, placed side by side with the best of European, received first premium at the centennial exhibition in 1876. The labels were removed and the flax was inspected by nine judges, who viewed it one at a time, making their selections, which were duly handed in to the chairman of their section. When opened, all had chosen the same Oregon fiber. The verdict read for extraordinary length, silky softness, gloss, and strength. The percentage of fiber to straw is unusual. It has run 35 pounds to the 100 in well retted straw, while the Irish average, 20 to 24, is considered *very good*. Oregon straw can be depended on to make 24 to the 100, and to give a strong, elastic fiber well suited to thread making and warp yarn spinning. Our experiments last season were very gratifying in their results. Straw was brought in from one farm which averaged 48 inches in length; quite a little, 52 inches, and some even 69 inches. This last, however, was coarse. We are under the impression that flax can be grown instead of summer fallowing; weeds are kept out, the land left friable and in fine condition for fall plowing. Superior fields of wheat are now growing on the land that was in flax last season. Thousands of acres of the finest flax land the world can offer is waiting for occupancy, and already the emigration of the better class of European farmers —the sturdy hordes—is tending this way with the intention of developing this industry. We trust the growing of the crop, remunerative to the farmer, and the weaving into fabric, which is the best paid of manufacturing enterprises, will go hand in hand, the one sustaining the other, building up our towns, utilizing our superb water powers, and giving healthful, profitable employment to labor.

SUGAR BEETS.

By Professor G. W. Shaw, Oregon Agricultural College.

Can Oregon stand in the line of sugar-producing states, and thus reap the rewards that are bound to follow in the wake of such an industry? Can she not gain the advantages to be derived from the building up of prosperous communities around a factory, furnishing better markets for home products and encouraging the farmer to adopt more scientific modes of cultivation, which certainly would extend to other farm crops than beets, until their influence would be felt all along the line of agricultural pursuits? If the soil and climate of Oregon are favorable to the production of beets rich in sugar, and economic conditions are inviting, then a new and profitable industry is possible for the state.

It was to answer these questions that a few years since the writer, as chemist of the Oregon experiment station, began an extended series of experiments in the growing of beets, and testing their quality for sugar production.

It is in the development of the sugar beet, whose wild ancestor is still a weed on the seashores of Europe, that chemical science has achieved one of her most marked benefits to mankind.

Crystallizable sugar was obtained from beets in 1747, but it was about half a century later before any success was achieved in its extraction. At first only about 3% of crystallized sugar could be obtained, although the beet contained from 6% to 7%. The demands of the Napoleonic wars on the one hand, and human needs on the other, continued to concentrate attention upon the beet as a sugar-producing plant, until in 1813, a report of the French minister of the interior stated that during the year past 7,700,000 pounds of sugar had been made, which was the output of 334 factories. In other European countries the industry had assumed a commanding position. From that time to the present there has been a steady growth of the industry, till now more than one half the sugar of the world is made from beets, and instead of receiving a bounty in Europe, as at first, it is now subject to an internal tax. In the meantime, by selection and cultivation, the sugar in the beet has been increased to 15%, a large portion of which, by the improved methods of extracting and purifying, can be obtained as crystallized sugar. The industry has constantly grown in Europe until she now has about 1450 factories in operation.

But what of the conditions necessary for the successful growing of this greatest of all sugar-producers? Let us examine as to climate and soil, that some *a priori* idea may be had.

The season for the growth of beets may be divided into three periods—that of germinating, that of plant formation, and that of sugar-storing. The following is a comparative table showing the temperature averages for Germany and certain parts of Oregon during these periods:

AVERAGE TEMPERATURE FOR PERIODS OF GROWTH.

	Foreign.	*Eastern Oregon*	*Willamette Valley.*	*Southern Oregon.*
First	49·1	50·0	52·5	53·3
Second	63·3	65·0	64·4	64·5
Third	56·8	64·5	63·8	54·8

It is in the rainfall of the state that we find the greatest seeming deviation from those portions of the world which are taken as typical beet-producing regions. This seeming difference should not be considered a too serious drawback, nor would it appear so to those acquainted with all the conditions. The average amount of rainfall does not differ much from that of the beet-growing regions of other countries, yet it is not as evenly distributed. It must be borne in mind, however, that the soils of Oregon are much different with respect to their retentiveness of moisture, as well as their power to absorb it during the growing season, and that for all our crops the necessary moisture nearly all falls during the "wet season," and for this reason we do not consider the monthly rainfall as bearing so close a relation to the crops as it does in most other states, but rather are wont to consider the seasonal precipitation as the more important factor. In this respect, ours is similar to our sister state, California, in which the beet industry has reached a high state of development.

Beets seem to have little preference in soils, yet they are the most grateful for a sandy loam of considerable depth. Speaking concerning this matter, Commercial Agent Hawes says:

"The best soils for quality, as well as quantity of production, according to the experiments of Orth, are those that consist of mild, moist loam about 50 centimeters (20 inches) deep, the loam or marl 1 to 2 meters (3 to 6 feet), and, under this, sand. Such soils, which are easy to cultivate, have a high degree of absorption, can combine nourishment, and give the plant physically a good start. Such soils are called 'natural sugar-beet soils.'"

So far as the chemical constituents of the soil are concerned, phosphoric acid seems to bear the closest relation to the amount of sugar, or, if this be wanting, sugar will not be provided, while a lack of lime would be replaced by potash, soda or magnesia.

Champion and Pelet consider phosphoric acid as an indispensable base for the formation of sugar in the beet. They classify the order in which the plant food is indispensable, as follows: 1. Phosphoric acid; 2. lime; 3. nitrogen; 4. potash.

It is foreign to our purpose to discuss, at this time, the soils of Oregon at any length, but, in connection with the last statement, I desire to direct attention to the fact that the soils of Oregon are well—yes, abundantly—supplied with phosphoric acid, that they surpass those of France in lime, and equal them in potash. Below are contrasted analyses of some of the French sugar-beet soils with those of the natural divisions of this state, and those of California. These results, I think, speak for themselves, and need no further comment:

AVERAGE COMPARATIVE COMPOSITION OF SOILS.

Analysis of fine earth.	*France.*		*Oregon.*			*California.*
	Somme.	*Nord.*	*Eastern.*	*Willamette valley.*	*Southern.*	
Insoluble matter	81·80	82·55	66·59	65·18	62·45	67·88
Soluble silica	81·80	82.50	13·12	5·02	8·74	8·96
Potash (K_2O)	·06	·14	·48	·23	·34	·64
Soda (Na_2O)	·09	·14	·22	·18	·21	·28
Lime (CaO)	·51	·42	1·22	·83	2·22	1·08
Magnesia (MgO)			·75	·79	·80	1·49
Manganese (Mn_3O_4)			·10	·08	·25	·06
Iron (Fe_2O_3)	2·88	2·18	10·69	16·45	15·85	15·02
Alumina (Al_2O_3)	7·24	8·62	10·69	16·45	15·86	15·02
Sulphuric acid (SO_3)			·04	·08	·01	·05
Phosphoric acid (P_2O_5)	·09	·08	·14	·21	·13	·08
Carbonic acid (CO_2)	·40	·7C				
Water and organic matter	5·60	4·84	6·21	10·77	9·52	4·40
Other matter	1·85	1·52				
Humus			1·44	1·68	2·25	·75

After a careful perusal of these climatic conditions, it would seem that the *a priori* exist for supposing the industry might be successful so far as the production of the beets is concerned.

Given, then, these conditions, can we grow beets sufficiently rich in sugar and at a price the factory can afford to pay and still leave a reasonable profit to pay the grower? To answer this we must prove experimentelly:

First—That beet sufficiently rich in sugar can be grown in Oregon.

Second—That they can be grown with a sufficiently large tonnage to make it profitable for the farmer, at the prices the manufacturer can afford to pay.

As indicated at the outset of this paper, the writer has conducted growing experiments in nearly every section of this state, and firmly believes that the question can be unqualifiedly answered in the affirmative, as far as certain sections of the state are concerned.

That we may have a standard with which to compare our Oregon beets, we should understand that, contrary to a popular idea which is quite extant in the state, the beet should be small, with a large, leafy top. Brien says:

"The size of the beet is in the inverse ratio of its sugars and salts; the content of water increases with its size and weight of the beet."

In general, the standard adopted seems to be a beet weighing from 1½ to 1¾ pounds, carrying 14% sugar, and having a purity of 80%, although factories will accept beets weighing as high as 3 pounds, and having as low as 12% sugar.

The average sugar content and purity for the states where sugar is now being manufactured from beets, is as follows:

	Sugar in juice.	*Purity.*
Nebraska, 5 years	13·5	80·0
Utah, in 1891, averaged	11·0	80·0
Utah, in 1894, averaged	12·7	80·2
Utah, in 1895, averaged	13·5	81·5
Chino, California, 1891, averaged	13·0	80·0
Chino. California, 1894–5, averaged	15·0	
California, average 5 years	14·9	83·0
Oregon, 1891	14·13	78·08
Oregon, 1892	15·7	78·08
Oregon, 1892 to 1897	14·9	83·0

RESULTS OBTAINED IN OREGON.

Thr attention of the reader is now invited to a consideration of the results obtained in Oregon:

An examination of the results of 1891 reveals that the analyses had a wide range, viz., from 6·77% to 22·44% sugar in the juice. Of the 95 analyses made, 8 fell below 10%, 76 showed over 12%, and 37 over 14% sugar. An average of 81 analyses for the Willamette valley shows 13·76% sugar and a purity coefficient of 77·89; the average beet weighing a little over 1¼ pounds, while an average of 10 analyses of beets from Southern Oregon showed 13·38% sugar, with a little larger beet; but this does not really show the capabilities of this part of the state, as will appear later, for there were quite a number of immature beets included in this average. For the entire state the average weight was 608·5 grains (about 1¼ pounds).

For the season of 1892 the average of all analyses for the state was 15·7 per cent. sugar in the juice, with a purity of 78·08 against 13·75 per cent., and a purity of 77·57 for previous season. Out of the 65 analyses made, only 11 indicated less than 12 per cent. sugar in the juice, and 41 samples indicated over 14 per cent., the extremes being 9.4 per cent. and 23.8 per cent. The averages for the different natural divisions of the state were as follows:

Willamette valley, 44 samples	14·7%
Eastern Oregon, 11 samples	19·2%
Southern Oregon, 10 samples	15·1%

While from 1893 to 1897 no definitely outlined experiments were conducted, yet the station furnished more or less seed to various parties, who sent the beets for analysis. In other cases, beet seed has been furnished by other parties, and analyses have been made in all cases when beets were forwarded to the station. The average of the results of 23 analyses made, from 1892 to 1896, shows 15·05 per cent. sugar in the juice, and a purity of 89·8 per cent.

During the season just ended, the experiments were continued, but were limited for the most part to those parts of the state which seemed to offer not only the best conditions for growing beets, but also presented other favorable economic conditions. The conditions for seeding were not particularly favorable; indeed, were adverse, inasmuch as the ground was entirely prepared in the spring and the seeding was late. The results obtained in the localities selected are given below:

County.	*Weight, grains.*	*Sugar.*	*Purity.*
Washington	487	16·6	86·7
Clackamas	486	18·7	83·4
Union	609	16·6	88·5
Jackson	503	15·6	81·0
Miscellaneous	528	14·3	85·8

Attempts were made in these experiments to secure reliable data as to yield and cost of crop.

In 1891, the average yield, reported by eight farmers, was 20.5 tons per acre, at a maximum cost of $24.18 per acre; in 1892 the average yield was 23 tons. That we may compare with other states, the yield reported in California was 14 tons per acre, which was based on actual results obtained by farmers in growing beets for the factory. Other results obtained in the same manner are as follows:

	1891.	*1892.*	*1893.*	*1894.*	*1895.*
Lehi, Utah	6·60	6·50	9·70	11·47	11·54
Chino, California	7·26	7·50	11·70	9·16	11·03

One striking feature in the above table is the increase in yield after the first two years—after farmers had become acquainted with methods of cultivation. To produce the highest yield, both in tons and in the per cent. of sugar, requires a certain amount of skill, which has to be learned by careful observation and study, which fact is illustrated in the above table.

Mr. John Henry, of Beaverton, and Mr. R. Kuhne, of Tigardville, Oregon, both undertook quite carefully conducted experiments during the past year. The former reports a yield of 10.5 tons per acre, which cost $42.89, not including delivery to the factory. Concerning the cost, Mr. Henry writes:

"In this experiment the cost per acre of beets is far too high. I put the seed in with a hand, instead of a horse drill, and dug with a spade, instead of a horse puller.

"The fact which I sought was the cost between the time the seed was in the ground till the crop was ready to dig, with labor costing 10 and 12½ cents per hour, and it was just $12.14. In the total is included:

Preparing the acre	$5 00
Seed, 8¾ pounds	2 62
Interest on land	8 00

"The ground had an ordinary plowing in March, and was plowed 10 inches deep, and seeded May 21. Previous crop was corn, manured."

It should be stated that Mr. Henry's beets were excellent samples, analyzing 18.3 per cent. sugar in the juice, with a purity of 86.7. For such beets as these a factory would pay about $5 per ton.

Mr. Kuhne's report showed a yield of 13 tons per acre, which cost $35. These beets would have commanded from $4.50 to $5, according to their sugar content, which in all cases was high, and the purity exceptionally good, thus giving a return of about $60 per acre, or a profit of $25.

I consider these results quite trustworthy, and fairly indicative of what may be expected from careful, intelligent work. Mr. Henry is a very careful worker, and has had much experience in vegetable growing. Mr. Kuhne has had many years' experience both in Germany and this country in growing beets for sugar purposes.

If we turn our attention to the results obtained the past season, we find the following average results from the sections named:

County.	*Yield.*	*Cost.*
	Tons.	
Washington	15·3	$ 24 00
Clackamas	16·8	26 00
Jackson	14·9	------
Union	23·2	11 20

These prices do not include rent of land and delivery to factory, which would average about 75 cents per ton.

Thus it would seem that the second question may be as favorably answered as the first. These beets would bring at the factory $4 per ton, or for the average crop $60 per acre. If we assume, on the basis of the above reports, that the cost will be $38 per acre, there would be a profit of $22, besides a fair rent for the land and good wages for the work, which could be participated in by nearly the entire family, for much of the work can be done by children.

As to the economic conditions, the Willamette valley would certainly find herself handicapped in two important particulars, viz., that of having early fall rains and no lime supply. The first might be overcome by crowding the growing season back so as to plant early in April, instead of the middle of May, as was done in these experiments. The lack of lime for the manufacture of sugar is a more serious question for the valley.

In both Eastern and Southern Oregon these conditions are fully met, for planting can be done much earlier than the time named, and the rains hold off later as well. Lime in abundance is at their very doors, as well as fuel and water of excellent quality. Indeed, I know of no section of this country offering better opportunities for this important industry than Union or Jackson counties.

CRANBERRY CULTURE.

By C. D. McFarlin, Empire City, Coos county.

I have been cultivating cranberries in Coos county for 13 years. Am situated within 2 miles of the beach. My cranberry bog is in an exposed place, subject to a fair rake of the northwest trade wind of the Pacific. Under these circumstances I cannot raise as large berries as I could raise on Cape Cod, but I can grow as many to the acre, with a much darker color. I claim my berries are superior in flavor, as they are in weight, to the eastern berry. Having had no experience in making bog either in Wisconsin or New Jersey, I can only speak of Cape Cod and Coos county, Oregon. From my experience I find I can make bog cheaper in the east than on this coast, but as a bog once made in a proper location will last indefinitely, only requiring resetting of vines at stated periods, the first cost, in the end, cuts but little figure, although quite large at first.

I have imported both the vine worm and the berry worm in vines that I obtained from Cape Cod, but they cannot live in this climate, and do not appear after the first year. The only insect which has hurt my vines is a large space worm that sometimes works on them the first and second years after planting. They do but little damage. I have been hurt some by the hot sun, and also by frost in the fall which destroyed the berry.

In proper locations, and handled understandingly, the business will be remunerative along the coast counties. Cranberry growing has become quite extensive in Washington up as far as the sound. There are many thousands of acres in Oregon that, in my opinion, can be profitably cultivated to cranberries.

SILK CULTURE.

By I. S. Kanemats.

The Southern Oregon silk station was founded in Coos county in 1893 for the purpose of experimenting in the practicability of silk culture. Series of experiments were made with 18 varieties of silk worms, imported from Asia and Europe. The experiments covered a period of three seasons, from 1893 to 1895, and the result was the adoption of a new variety, a cross-breed between the *O-Gon* (Japanese) and the *March* (Italian).

The eggs of the new variety, together with an instruction book entitled "A Handbook in Silk Culture" were distributed among those who desired to experiment, and who had some mulberry trees.

Up to the season of 1897 the number of applicants for the books aggregated 382, and 156 more for both books and eggs.

The number of mulberry trees planted since the station was founded is 2,186, which were secured through the station, besides, there were perhaps a few hundred more which were purchased by individuals directly from the nurseries.

These trees in the course of a few years will furnish leaves enough for an enormous army of silk worms.

The amount of cocoons raised in the district up to the last season of 1897 was (exclusive of those raised while experimenting) 228 pounds. These with the exception of a few pounds were reeled, producing therefrom 76 pounds of raw silk, of best grade, valued at $456.

FRUIT CULTURE.

By Henry E. Dosch, Commissioner for First District State Board of Horticulture, Portland.

"The world moves along not merely by the gigantic shoves of its hero-workers, but by the aggregate tiny pushes of any honest worker whatever. All men may give some tiny push or other, and feel that they are doing something for mankind."—*John Richard Green.*

It has been said that Oregon, the state of plenty, is nothing, if not an horticultural state. All fruits, including the tender olive, do exceedingly well here. In Oregon the planter cannot only find the localities best suited to the different varieties of fruits, but, in addition, has his choice as to climate. He may select Eastern Oregon with its extreme seasons, Southern Oregon tempts him with its enchanting valleys, clear skies, and balmy air. Then there is our own Willamette valley of two hundred miles or more in length, with its equable climate throughout the year; or if fond of sea breezes, the various valleys along our coast line. As between bottom lands and hillsides, the latter are preferred. Oregon, therefore, offers an inviting field for the orchardist.

The arid lands of the vast Island Empire, located east of the Cascade range of mountains, and especially along the cañons and flat areas of the Snake river, which were heretofore considered only fit to grow sagebrush and greasewood, and the home of the jack rabbit and toads, has proved wonderfully fertile under irrigation and under the management of progressive, up-to-date farmers and fruit growers. Canals have been dug, varying in length from 12 to 30 miles, covering thousands of acres of these lands which are now being brought into cultivation. It was my privilege to spend a week with some friends near Ontario, along the Snake river, last August, and to see the transformation of a desert into an oasis. Hundreds of acres had been sown to alfalfa, with surprising success. On the K. S. &·D. ranch they were harvesting the *third cutting,* and flooding the lands for the fourth crop; the average yield being seven tons of hay per acre for the season. On this same ranch is an orchard covering two hundred acres planted to peaches, apples, pears, and prunes, being then two, three, and four years old, in a most perfect condition, both as to health, vigor, and luxuriance of foliage, with the thermometer at 130° Fahrenheit in the sun. It is almost beyond belief what water, under the control of intelligent endeavor, will produce on these soils. This alfalfa is fed to hogs, calves, and steers for the markets. thus bringing a ready cash revenue to meet expenses, while the orchard is slowly but surely growing into a revenue-producing fact. Along these benches is room for thousands of happy contented homes, amid plenty to eat and drink, and pure invigorating health giving air to breathe. I never tasted finer peaches and watermelons than right there. Many of the grapes then forming measured ten inches in length to the bunch, with berries as large as marbles; in fact the bunch of grapes which won the medal at the World's Columbian Exposition at Chicago, was grown near the Snake river.

The beautiful Grand Ronde, Wallowa, Burnt river, Powder river, Eagle creek, and numerous smaller valleys scattered throughout these higher plateaus and Blue mountains, as well as Hood River valley, along the Columbia river, and which do not depend on irrigation, are most fertile spots for the fruitgrower, especially the rolling foothills. Perhaps nowhere do apples, pears, cherries and prunes, grow to greater perfection, as to size, flavor and color than in these valleys. A paper was recently read at a Farmers' Institute, held at La Grande, in which the writer said: "At Cove (the garden spot of the Grand Ronde valley), and here at La Grande, instances have been reported and verified where over $500 have been received for the product of a single acre of Jacunda strawberries, while there is no place under the sun where red raspberries do better than here." He considers the apple, pear and cherry the most profitable fruits for that locality. The fruits grown there, on account of the high elevation, and climatic influences, have peculiar keeping qualities; the cherries, owing to absence of rain, do not crack open, and by reason of so much sunshine color highly, come into market late, and consequently always bring remunerative prices.

Southern Oregon, with its decomposed granite soils, as found in the Rogue River and Umpqua valleys, offers the same advantages for horticulture, and at no distant day will be a veritable paradise for the fruitgrower. Its soils are naturally very rich in all the plant foods necessary to produce excellent fruits, combined with a climate unsurpassed anywhere in this fair land of ours. The vast mining districts of this section, which are fast assuming large proportions, will furnish a very good local market for the small grower, while most commercial growers prefer to ship their products to the East, England, and Germany, where these fruits have found a very profitable market. To illustrate: A few days ago I was shown a letter by one of our commission houses at Portland, who shipped the fruit for the grower, from the Hon. William T. Grinnell, American consul at Manchester, England, dated December 7, 1897, stating in a lot of apples received from Oregon, and on sale in that city, placards were found on which were printed, "Rogue River valley apples, from the orchard of C. Kleinhammer, Phœnix, Oregon," saying that finer fruit had never been exhibited in that market, and the dealers wanted to secure the output for another year. Thus showing what these valleys can produce, and opening another and unlimited market for the wideawake fruitgrower. Intelligent endeavor, honest packing, brains, and application of business principles, which hereafter must be adopted in order to be successful in horticultural pursuits, has its own reward. Peaches, apples, pears, prunes, walnuts, grapes, and watermelons, grow in great abundance. It is surprising that the growing of wine grapes has not been followed extensively. The Rogue River valley, which is, in respect to soil and climate, like the famous Burgundy valley of France, is the place par excellence for the growing of this variety of grapes. There is no good reason why the hillsides of that productive valley should not be covered with vineyards. Grapes of as good quality as those grown in California or in France can be produced in that valley.

Our own beautiful Willamette valley does, and always did, grow fine fruits. True, they have not the keeping qualities, owing to our humid climate, as those raised in the more dry localities and higher altitudes, but for size, color, and flavor are not excelled anywhere, besides having the advantage of nearness to the large local markets of our cities, as well as cheaper railroad and ocean transportation to the markets of the world. Here flourish the apple, pear, prune, cherry, peach, apricot—all the smaller fruits in great abundance, and grapes galore. That grapes do well in Oregon is evidenced by the fact that there are small vineyards in every part of the state, but I know of only one commercial vineyard in Oregon, which is located on the red hills back of Forest Grove, in Washington county—here is a vineyard of eighty-four acres. Every year these vines are weighed down with large bunches of the choicest grapes—each vine or stalk yielding from 50 to 100 pounds. These sell for $25 a ton. When the owners of these vineyards came to Oregon, not many years ago, they were in moderate circumstances. They had to clear the land and plant it to grapes, and now are well-to-do. I have been in the famous vineyards of Germany, France, and California, but have never seen such an abundance of grapes as these Forest Grove vines bear from year to year, nor have I ever tasted grapes of finer quality. The principal varieties grown are Moore's Diamond, Niagara, Sweetwater, Delaware, and Hamburg. Such wine grapes as the Riesling, Gut-Edel, Burgundy, and Zinfandel would also thrive here.

The beautiful and fertile little valleys along our coast line are all adapted more or less for fruit growing. This has been proven by Mr. T. S. Malehorn, of Langlois, Coos County, a most progressive orchardist, who has not alone succeeded in growing nearly all the varieties of fruits grown elsewhere in the state, but has now fruiting acres of the tender olive. A little enterprise and energy will accomplish wonders in horticulture and viticulture in Oregon.

However, there is one fruit which does not have the attention it deserves, and that is the growing of nut-bearing trees. We now import into Oregon between $300,000 and

$400,000 worth of nuts, and the demand is increasing. I have been advocating the planting of nut-bearing trees, more particularly the French walnut, for many years, and have received some letters of inquiry regarding nut culture, and know that some trees have been planted, in an experimental way, which have done exceedingly well, but I know of only one planting of a commercial grove, consisting of 40 acres of French walnuts and chestnuts, though there is a grove near Portland, on a gravelly hill, of 300 trees; one near Eugene of 400 trees, and at Albany of 100 trees, besides my own, so there is almost an unoccupied field which promises equally as good returns, if not better, than any other kind of fruit by way of intensive and diversified farming. This is now well recognized and understood in the east, since the wild nut-bearing trees, which grew so plentifully, have been cut down wastefully and used for posts, fences, and fire wood. The scarcity has become so marked that attention has been called to it by the trade, and many new plantings are now being made. When I first planted my own, in order to thoroughly satisfy myself as to the adaptability of our soils and various climatic conditions, I gave away 200 yearling trees of my own growing. I sent them to friends in various parts of the state—to Eastern Oregon, Southern Oregon, the coast counties, our own Willamette valley, and even to the Sound counties of Washington—and the reports received have been most gratifying. Last summer I saw some of these trees, which had grown to height of 20 feet, with a spreading top of 14 feet, and measured 7 inches in diameter 4 feet from the ground. They have proved most indifferent as to location or soil, whether on clay, loam, or gravel, and even rocky ground, providing there is a loose subsoil for the tap root to go down. It is perfectly useless to plant nut-bearing trees where there is hardpan subsoil. I gathered over 20 pounds of nuts from one 8-year-old tree on a friend's place, which, at 15 cents per pound, brought $3 to the tree. Mrs. B. M. Shannon, of Albany, sold last fall over 100 pounds of Mayette and Franquette walnuts from two 9-year-old trees for 35 cents per pound.

Here is a line of fruitgrowing which offers exceptional inducements, and now that it has been proven that nuts of excellent quality not only grow, but mature in this state, it would seem that this money should be kept at home. They begin to bear when 6 years old, and from that time on they are a source of revenue. They seldom fail to bear enough fruit to pay for the labor and the expense of taking care of them and gathering the crop. Growers should be careful to plant only such varieties as are known to be suited to our climatic conditions. The varieties of walnuts recommended are Mayette, which is known in the markets as the Grenoble; Franquette, Parisienne, Proeparturien, Serotina, and Columbus; of chestnuts, Grosse Precose Paragon, Nouzziland, and Combale; almonds, Grosse tendre or Lanquedoc for Northwestern and Eastern Oregon, and the I X L, Princess, and Nonpareil for Southern Oregon. The growing of nut-bearing trees is profitable on more than one account. There is a good demand for their wood, especially the curl-grained French walnut, which is used extensively in making household and office furniture.

Horticulture is no longer an experiment in Oregon. The incessant drudgery, the numerous and keen disappointments which are peculiar to all new enterprises and from which horticulture in Oregon did not escape, are things of the past. We have reached the era of scientific management of the orchard and of remunerative prices for the product. Fruit growing is as profitable as any of the several branches of agriculture; in fact, it has been proven year after year that those who have fruit to sell, whether it was raised alone or in connection with other crops, always have money to meet their obligations. The commercial agencies report that there are fewer failures among those engaged in horticulture than there are in any other branch of agriculture.

Though fruit has been grown in Oregon for over 40 years, it is only recently that horticulture was reduced to a scientific basis. The backwardness which was the ruling condition until a short time ago, was due to lack of knowledge about tree planting and fruit growing. Very few growers were thoroughly equipped for the business in which they had invested their capital. The state took horticulture in hand, and now supplies an abundance of information to all who care to ask for it. This information is distributed through members of the board of horticulture and the faculty of the Corvallis Agricultural College. There now exists no reason for failure, because of the absence of useful information about soils, stock selection, tree planting, cultivation, pruning, and the science of pollination. That the growers have profited by the work done in their behalf by the state, and that there has been a vast improvement over former methods is abundantly proven by the touching up given to old orchards, and the strong, healthy looks of trees which are now growing into bearing. Progressive horticulture does wonders. It makes the old trees bear fruit again and gives the young ones a good start from the time they are set out. Failure and discouragement in horticulture often result from too much real estate booming. Glowing accounts of this or that locality are published, fruits of abnormal size are exhibited, ridiculous results are given, all of which creates the impression that horticulture, in certain localities, is a veritable Klondike. Credulous persons, tempted by these stories and exhibits, give up occupations in which they are experienced, and take to fruit raising, of which they know nothing. With them failure is only a matter of time, unless they have an abundance of money. Horticulture is a special work, an applied science. In it expectations are never realized without painstaking work and trying patience. No one should think of going into it when the main inducement is an enormous profit figured on paper. There are growers in Oregon who have made large profits in a single year. In some years all have done exceedingly well, but, generally speaking, it is not safe to count on a net profit of more than $100 per acre in ordinary years for an orchard in full bearing. This result, small as it may seem to the uninitiated, will come only to those who go into the business understandingly, give to it their best thoughts and care, manage the fruit farm as they would any other business venture, and keep abreast of the times. The failure of those who had no adequate knowledge of fruit growing and who under the same circumstances would have failed in any other enterprise, need not discourage any who intend to embark in horticulture. The number who have failed is very small in comparison to the number who have succeeded. No state offers such excellent advantages as Oregon does. There need be no fear of overproduction. The consumption of fruit increases every year, and there is ready sale for all first-class goods put on the market. The enlarged use of fruit is due to two important factors:

First—The low prices that prevailed for several years have placed fresh and evaporated fruit on the market in the mining and manufacturing centers never reached before, and within the homes of families who, when high prices were the rule, could not afford to buy fruit. A demand for our fruits has sprung up in the South; the colored population, particularly, are very fond of the French prune, which they like better than any fruit going, except the watermelon.

Second—The doctors, aided by the medical press, are strongly advocating the consumption of fruits to promote health, not only in America, but abroad.

Dr. Beutzer, of Germany, the noted scientist, and Dr. Sophia Lepper, the great English food specialist, give their emphatic indorsement of fruit as hygienic agents. Dr. Beutzer dwells particularly on the apple, and declares that an apple eaten immediately before bed time will promote general health; its dietical as well as alimentary substances is of the highest order; it contains more phosphoric acid in an easily digestible combination than any other vegetable product. While Dr. Sophia Lepper says: "Apples supply the higher nerve and muscle food, but do not give stay; prunes afford the highest nerve and brain food, supply heat and waste, but are not unusual feeding; the walnuts give brain and nerve food, muscle, heat, and waste." What a happy combination, apples, prunes, and walnuts.

The era for high prices, especially for prunes, has past, and we do not want it to return, for when prices advance, consumption decreases, which is not desired. It has been demonstrated time and again that prunes at 4 cents per pound, and apples and pears at

50 cents a box of 40 pounds, the lowest price ever paid, will net to the grower over $100 an acre for an orchard in full bearing; while we know that good marketable apples and pears during winter and springtime sell at from $1 to $2 per box. It could stand a considerable reduction from the first figures named and still leave horticulture more profitable than other agricultural pursuits.

While waiting for his orchard to bear, which usually takes from five to eight years, the orchardist has an avenue of profit opened to him in the growing and marketing of small fruits. The demand for strawberries, currants, gooseberries, raspberries, and blackberries for home consumption and for export is very large and is seldom met by the supply. Many carloads of these fruits, especially strawberries, are shipped every year to the mining and stockraising districts of Idaho, Montana, North Dakota, and South Dakota. Shipments of these berries are often made to St. Paul and Omaha; yes, even to Chicago, yielding most gratifying results. If the small fruits are given proper care and sent to the market in good condition, they bring in sufficient money to meet the family expenses. Even after the orchard begins to bear, there is nothing to prevent the orchardist from having two crops—berries in the spring and early summer, and tree fruit in the fall, thus dividing the labor and at the same time doubling the profit. In some parts of the state orchardists plant beans between the rows of young trees. This crop yields a net profit of about $30 per acre.

Horticulture on a large scale offers exceptionally fine opportunities. An orchard conducted on this plan is termed a commercial orchard. As yet there are few orchards in Oregon where fruit is grown for shipment in carload lots. There are two of apples exclusively, one having 10,000 trees and the other 15,000 trees; one of pears, having 12,000 trees; two of apples and pears mixed, and a few prune orchards, having between 10.000 and 20,000 trees. Most of our prune orchards contain 5 to 20 acres. They are to be found in all parts of the state. The two large apple orchards referred to are not yet in bearing, being now 5 years old. The trees in the other orchards are from 6 to 8 years old, and have borne several crops, which were marketed at very good prices in the east. The fruit of one of the pear orchards sold for 87½ cents per box, f.o.b. at Salem, and that of the other for $2.40 per box in New York and Boston. While the owners of these large orchards were highly successful in the growing and marketing of their crops, the policy of confining one's self to one or two varieties of fruit is open to question, and as there are off-years in horticulture, in one or the other fruit, as well as in other lines of business. It is prudent therefore to plant a variety, so that if one kind fails the other will make up the loss. The planting should be in alternate rows for pollination purposes. For example, in setting out apples, plant first a row of, say, Wolf River, next a row of Spitzenberg, then a row of Ben Davis or Jonathan, or Gravenstein or Gano, just such varieties as one desires to plant; in pears, one row of Bartletts, then one row of Beurre Clairgeau, then one of Fall Butter, then one of Beurre d'Anjou, and then repeat. The same method should be followed in planting other kinds. It is always best to avoid mixing the different varieties. Apples should be planted in one block, pears in another, prunes in another, and so on.

A writer said that "most farmers who have been raised on a farm know how to do good farming. They know how to save and apply manure; how to mellow the stubborn soil with plow, harrow, and cultivator; know the value of good seed, the proper time to sow, and the quantity required. They understand the necessary drainage; the rotation of crops, and green manuring. Most farmers know how to do good farming, but they do not farm so well as they know how. Why don't they farm so well as they know how? They lack the proper pride. They have too little ambition." What has been said here of farming in general applies with equal force to horticulture. Ambition is the vital force which prompts great deeds, and moves the world. How to excite this enthusiasm and put this power into action is a question to be considered and solved by the progressive orchardist. In these days of push and advancement, one of the principal essentials to success is the ability to do the right thing at the right time. This ability is absolutely necessary for the success of everyone. It manifests itself in the individual by keen perception, sound judgment, practical knowledge of business, and a determination to profit by every opportunity that presents itself.

That our fruit is equal to that grown in any other part of the world is evidenced by the fact that at the World's Columbian Exposition at Chicago we carried off all 13 of the diplomas and medals awarded in the horticultural department. We won the prizes for apples, pears, peaches, cherries, and prunes in their fresh, as well as in their evaporated state; for grapes, the largest bunch weighing 8¾ pounds, and even for French walnuts Colonel E. F. Babcock, a life member of the American pomological society, president of the Arkansas state horticultural society, and a nurseryman and fruit grower of many years experience in Western New York and Arkansas, was pomaceous judge at the exposition. So deeply was he impressed with the superior quality of the fruits of Oregon that he determined to visit the country which produced such fruit. Upon his arrival in Portland in December, 1893, he was interviewed by the editor of the Rural Northwest, and his statement was read and approved by him before its publication. In that interview he said: "It goes without saying that the display of fruits at the Columbian Exposition was by far the largest and most comprehensive of any heretofore made at any time or place. * * * In this grand display Oregon occupied a leading position. The fruits shown were very large and fine, beautifully colored and free from insect pests. * * * It is safe to say that no exhibit attracted so much attention in the horticultural department or was so highly commended."

Mr. Sylvester Johnson, who was for 11 years president of the Indiana state horticultural society, and judge of agricultural implements at the Columbian exposition, said, at the meeting of the Indiana horticultural society held at Indianapolis, when Oregon fruits were under discussion and highly praised, that he wished to emphasize what had been said about Oregon fruits. He added: "I regard Oregon as preëminently the fruit state of the union, and its fruits were better than those of California. This exhibit forever dispelled the opinion that California possesses superior advantages for fruit-growing to that of every other region of the Pacific slope. The Oregon exhibit of apples, pears, and plums was not only unequalled, but it excelled that of every other state. The fact may be noted that the largest apple, the largest pear, and the largest cherries exhibited at the Columbian exposition, were grown in Oregon."

While it is conceded that all the various fruits can be grown in Oregon, the highest success can only be obtained by the intelligent, painstaking orchardist. The man who thinks that all that is necessary, even in this favored state, is to scratch the ground, throw in his trees in a haphazard way, with an occasional plowing or harrowing, and let it go at that, will soon find himself very much undeceived. Brains are as essential on the farm and in the orchard as in the office or counting room. When Meissonier, the great French artist, was asked, how he succeeded in painting such beautiful pictures, replied: "I mix my colors with brains." In an editorial of recent date in the Oregonian headed, "Brains in the Workshop," this point was made very clear, and in summing up is said: "The way lies through intelligent investigation of markets and methods, and the application of brains to the agricultural and horticultural problems. We must study to please the tastes and notions of the world's consumers, and must avail ourselves of the researches of the biologist, the bacteriologist, the entomologist, and the investigations of the expert in crops and market conditions. Uninformed and unenlightened labor is at a great disavantage in these days of sharp trading and scientific adaptation of means to ends."

Horticulture, as we understand it, is no longer the problem it was, thanks to the scientific investigations of the professors of the experiment stations throughout the world, and to practical fruit-growers. We know the best soils adapted for the various fruits, the best varieties to plant for family use or commercial purposes, and know how to evaporate them. We also know what varieties to plant together for pollinating purposes. We know the diseases and insects infesting trees and fruits, and how to combat them. Hence, there is no good reason for any one contemplating following horticultural pursuits to make a mistake or a failure. Intelligent endeavor will surely have its reward.

I am firmly of the opinion, that as soon as the Nicaragua canal is finished, in the construction and completion of which we here in Oregon are particularly interested, it will bring about great results for the Oregon farmer and fruit-grower. Meats have been transported in cold-storage steamers, through all climes and to every land, and so will be our fresh fruits. Tramp steamers, which are now traversing our seas in every direction, seeking cargoes from anywhere to anywhere, will crowd our docks, eager to carry our surplus fresh fruits to the markets of the world, and competition will make freights low enough to allow a good margin to the grower.

To illustrate: A carload of wheat from Portland to New Orleans at present costs 45 cents per bushel, while with the Nicaragua canal finished the freight ought not to, and most probably would not, exceed 12 to 15 cents per bushel, including canal charges, etc. A carload of evaporated prunes to New York costs 1 cent per pound or $200; to New Orleans it costs 1¼ cents per pound or $250. A carload of fresh apples or pears in refrigerators to New York costs $450, and to New Orleans $550, for 20,000 pounds, while in cold-storage steamers, through this canal it would cost $200 and $180 respectively for the same quantity, taking as a guide prevailing freight rates in cold-storage steamers to other points of equal distance. On evaporated fruits the freight would not exceed 40 cents per hundred pounds, or $80 for 20,000 pounds, as against $200 and $250 for same quantity by rail. It requires no microscope or mathematical calculator to see the margin for the producer; nor is this all; the greatest benefit comes to the small grower who cannot ship in carload lots, and must sell at home in an open market for whatever may be offered him. Upon completion of this canal the freight per pound on 10 or 50-case lots will be the same on the steamers as on 500 or 5,000-case lots. There will be fifty buyers in our home market where there is one now, and if the prices offered do not suit, he can look up his own market and ship direct to small dealers, knowing that in the matter of freight he is on an equal footing with everybody else.

The benefits to be derived from this national work by the fruit growers of Oregon can only be surmised at this time; but when we consider the reduction of freights to the Eastern and Southern States, and the South American countries, and the possibility of shipping on board steamers in cold storage our fresh fruits to these markets and Europe, we cannot help speculating as to the ultimate result.

Those having orchards, or who are now planting, or contemplate planting, will certainly be largely benefited when this great canal, this missing link, this national maritime highway, which is an imperative necessity for the Pacific Northwest, opening to the Mexican Gulf, to the entire Mississippi valley, and the states of the Atlantic seaboard, not only the reciprocal interchange among ourselves, but the whole commercial world, shall be completed, the practicability of which is conceded by all who have given the question any thought.

All that contributes to the general welfare and happiness of the citizen, strengthens the bulwarks of our enduring nationality, and there is no work more direct or more able of this consummation of properity and happiness for all, and the Pacific Northwest in particular, than the construction of this commercial link, the American Nicaragua canal. So let us hope that, at no distant day, this may be an accomplished fact, with our flag floating at either entrance, waving peace and welcome to the commerce of the world, that our grain and fruit laden ships may enter, and the American eagle hover over every ship, no matter what flag she may fly, with his wings spread out, reaching from shore to shore, giving her safe guidance and protection until she again reaches the high seas.

ESTIMATED COST OF AN ORCHARD.

From the report of the State Board of Horticulture, 1897.

As there has been a great demand on this office, from parties who contemplate planting orchards, for information as to the cost of planting an orchard and getting it into bearing condition, and the income to be expected during that period, steps were taken to get as much reliable information as possible on the subject. Many of our oldest and most reliable fruit growers were asked to give the cost and product of their orchards up to the eighth year. It will be seen from the estimates given that the cost and product varies considerably. This is accounted for by the fact that the price of land varies according to location and its condition when bought, and in some cases there is additional expense caused by subsoiling, more thorough preparation of the soil before planting, more careful selection of trees, more thorough cultivation and spraying, while some allow for a certain percentage of loss of trees and an occasional off year in bearing. Yet, by making due allowance for drawbacks, exercising the proper judgment in the selection of soil for the varieties to be planted, and giving the proper treatment to the orchard from the time it is planted, it will be seen that an orchard is a safe and profitable investment. Carelessness in any branch will not pay in orchard work. Business principles must be employed in every department. The following estimates include the cost up to the seventh year, or when the trees have six years bearing wood.

COST OF A PEACH ORCHARD NEAR ASHLAND.

By Max Pracht, Ashland.

As regards the cost and care of an orchard to the age of 7 years, I beg to say that my own experience as to the cost is not a true criterion, from the fact that for 5 years after setting out my orchard was cared for by persons employed by me, but working under my orders, while I was engaged in other occupations. I will give you, however, a very nearly accurate estimate of the cost of a peach orchard, taking the ground in the brush and until it comes to profitable bearing, which by my method of cutting back is not until the fifth year after setting out, or say 6 years from the bud. Good peach soil is light, porus, marly, warm, and easily cultivated land, neither springy nor boggy, such as our decomposed granite, and must be on a sloping hillside, with an exposure to any point of the compass, except due west, or proportionately such as veer west from north or south. The best range is from northeast to south, at least such is my experience here. Having selected the location, choosing—

Land per acre	$	100 00
Cost for clearing and grubbing per acre		80 00
Cost for plowing and subsoiling per acre		5 00
Cost for laying out and digging holes per acre		8 00
Cost for trees and setting out		20 00
Cost for pruning and shaping first year		1 00
Cost for fencing around orchard must be added, varying with the style of fence and size and shape of orchard, estimated at		16 00
Total cost at end of first year	$	180 00

Second year—

Amount forward	$	180 00
Plowing, cultivating, and pruning per acre		10 00
Replacing sickly or ill-shaped trees per acre		2 00
Digging for and exterminating borers		1 00
Interest at 10% on $180		18 00
Total cost, end of second year	$	211 00

Third year—

Amount forward	$	211 00
Plowing, cultivating, and pruning		10 00
Replacing sickly trees, etc.		1 00
Digging borers		1 00
Interest at 10% on $211		21 00
Total cost, end of third year	$	244 00

Fourth year—

Amount forward	$	244 00
Plowing, cultivating, and pruning		10 00
Digging borers		1 00
Interest at 10% on $244		24 40
Total cost, end of fourth year	$	279 40

Fifth year.

Amount forward	$	279 40
Plowing, cultivating, and pruning		10 00
Digging borers and slack liming		5 00
Hand thinning fruit		1 00
Interest on $279		27 90
Total cost, end of fifth year	$	323 30

We have now as the cost per acre of an orchard of not less than 10 acres and in perfect condition, at the end of the fifth year, the first year of market bearing, $323.80.

These trees should produce each an average of 20 pounds of marketable fruit, worth here not less than 2½ cents per pound, and up to 4½ cents, say 50 cents per tree, 160 to the acre, $80; culls and scrubs for home consumption, $10; total revenue at end of first year, age of orchard five years, $90.

From this time on the annual increase of productive capacity may be rated at one box or 20 pounds per tree to the eighth year, when an orchard in prime condition should mature an average of 80 pounds or four boxes per tree; and with trees one rod apart, properly dwarfed, this output should not be exceeded, so as to conserve the vigor and life of the tree; by which method in this locality a peach tree is good for 20 years of profitable life, and will bring at least $2 per year. From these estimates of cost any one can figure out the progressive cost of maintaining the orchard, figuring out the net profits at the end of each season. I have purposely omitted the items of taxes, as they vary so much, but are not high.

During the fourth year, though no income from the sale of fruit is shown, there will be enough peaches, which may be safely left on the trees, for home consumption. The cost of picking, packing, and marketing is not shown in the estimate, because the price named, *i. e.*, 2½ cents per pound, is a price at which prime fruit is always salable *on the tree* to first-class buyers who will harvest and market on their own account.

COST OF AN APPLE ORCHARD NEAR GRANTS PASS.

By A. H. Carson.

We have found in 15 years' experience the following to be the cost of planting and caring for an orchard up to the seventh year. Apples, (1 acre):

Dr.

To plowing and preparing ground	$	3 00
To 69 trees two years old at 12½ cents each (25 by 25 feet apart)		8 63
To one day's work planting and laying off ground		2 00
To cultivating and pruning seven years at $6		42 00
Total cost on one acre to seventh year	$	55 63

Cr.

By 69 boxes of apples at 50 cents, up to seventh year	$	34 40
Net cost per acre	$	21 23

It is seen, from the foregoing, the profits of an apple orchard up to the seventh year are on the wrong side of the account, but we now have it at the age when it will begin to pay. The eighth year, if the trees are in good ground, they should produce four boxes of apples to the tree. As the orchard increases in age, the expenses of cultivation, spraying, and pruning increase; but, if the orchard is cared for each year the maximum cost for cultivation, spraying, and pruning, will not be greater any year than $10 per acre. Then the maximum production of the orchard each year is hard to estimate, but after an apple orchard is nine years old, one year with another, the average production would not be less than 10 boxes per tree, or 690 boxes to the acre.

COST OF A PRUNE ORCHARD IN POLK COUNTY.

By James R. Shepard, of Zena, Oregon.

I estimate the cost of ten acres planted in prunes, twenty feet apart, under ordinary conditions, as follows:—

Dr.	
One thousand one hundred yearling trees (one hundred and ten per acre) at 6 cents	$ 66 00
Preparation of land (plowing and cultivation)	20 00
Setting out one thousand one hundred trees (at 1 cent each)	11 00
Cultivation and care first year*	
Cultivation and care second year*	
Cultivation and care third year (no other crop)	30 00
Cultivation and care fourth, fifth, sixth, and seventh years	120 00
Cr.	$ 247 00
Fourth year, one third bushel of prunes per tree at 60 cents per bushel, 20x1100	$ 220 00
Fifth year, one half bushel of prunes per tree at 60 cents per bushel, 30x1100	330 00
Sixth year, count a failure of crop	
Seventh year, one bushel of prunes per tree, dried	1,100 00
	$ 1,650 00

In some instances these figures will be doubled, in others reduced. It will be observed my estimates are very conservative, and no one need do worse, provided he uses ordinary care and judgment; but very much depends on location, soil, etc. I think a net profit (after seven years of age) of $100 per acre is not at all an extravagant estimate at present prices, say 5 to 6 cents per pound.

An occasional off year must be reckoned on, say one in four for Italian, and one in eight for Petite. Estimates of $300 to $500 per acre are misleading, I think, though much better has occasionally been done under high prices and favorable conditions.

My estimate presupposes proper pruning. Where land is well cultivated, but no pruning is done, a bushel per tree the fourth year may be realized, but the tree is injured thereby.

COST OF A PRUNE ORCHARD NEAR SALEM.

By R. D. Allen, Silverton, Oregon.

First year—	
Cost of trees per acre	$ 10 00
Planting same	3 00
Plowing ground 1 foot deep, and subsoiling 8 inches	4 00
Harrowing and cultivating, eight times	2 40
Hoeing around trees	60
Total cost, first year	$ 20 00
Second year—	
Interest on land at $50 per acre at ten per cent	$ 5 00
Interest, previous year's expenses, at ten per cent	2 00
Plowing	3 00
Harrowing and cultivating, eight times	2 40
Hoeing around trees	60
Pruning and removing borers	1 00
Total cost, second year	$ 14 00

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* More than offset by potato or bean crop.

Third year—

Interest on land	$	5 00
Interest on expenses		3 40
Plowing		3 00
Harrowing and cultivating, eight times		2 40
Hoeing		1 00
Pruning and removing borers		1 50
Total cost, third year	$	16 30

Fourth year—

Interest on land	$	5 00
Interest on expenses		5 00
Plowing		3 00
Harrowing and cultivating		2 40
Hoeing		1 00
Pruning and removing borers		2 00
Total cost, fourth year	$	18 40

Fifth year—

Interest on land	$	5 00
Interest on expenses		6 87
Plowing		3 00
Harrowing and cultivating		2 40
Hoeing		1 00
Pruning and removing borers		2 00
Total cost, fifth year	$	20 27
Total cost for five years	$	88 97

The above is without the first cost of land and taxes being included.

COST OF AN ORCHARD NEAR NEWBERG.

By O. E. Hoskins, Springbrook, Oregon.

Much depends on the location, quality of soil, and tools used in planting, cultivating, etc., of orchards as handled in Oregon. The difference between the owner and hired help would in many cases be 25%.

Expense bill per acre.

Plowing, subsoiling, cultivating, etc.	$	7 50
Trees, planting, cultivating, etc.		16 50
Second year cultivation		5 00
Third year cultivation, trimming, etc.		6 00
Fourth year cultivation, trimming, etc.		7 00
Fifth year cultivation, trimming, etc.		8 00
Sixth year cultivation, trimming, etc.		8 00
Seventh year cultivation, trimming, etc.		8 00
Eighth year cultivation		8 00
Total	$	74 00

Amount of fruit from 100 *trees—Apples, pears, etc.*

Fifth year	1,500 pounds
Sixth year	3,000 pounds
Seventh year	6,000 to 9,000 pounds
Eighth year	12,000 to 15,000 pounds

Prunes, plums, etc.

Fourth year	1,000 pounds
Fifth year	3,000 pounds
Sixth year	6,000 pounds

Seventh year	9,000 pounds
Eighth year	12,000 pounds

The above is without the original cost of land, interest, taxes, loss of trees, etc.

COST OF AN ORCHARD IN GRAND RONDE VALLEY.

By James Hendershott, Cove, Oregon.

I can only approximate the cost, as I have never kept an expense bill. After planting, 5 cents per tree will cover all expenses up to 4 years old. After trees are 4 years old they will yield a profit to the grower. My prune trees are now 12 years old. They averaged this year 280 pounds. Peach plums, same age, averaged 326 pounds. Apples, same age, averaged 490 pounds.

The man who asserts his prunes produce 1,000 pounds to the tree exaggerates for what money there is in it. If apples can be kept sound, they will pay 100% more than prunes.

STOCKRAISING.

Oregon has been for years the great cattle center of the Pacific northwest. It is also noted for its production of horses and sheep. The mild winter climate, the fact that the native grasses remain green during most of the year, and the ease with which the cultivated grasses can be raised, make Oregon an excellent country for every kind of stock. The general practice of Western Oregon farmers is to provide fodder for only a part of the year, during the balance of which the stock roam at large, while in Eastern Oregon vast numbers never tasted prepared food. During the cold weather (in Eastern Oregon) which is occasionally experienced in winter, live stock sometimes suffers, but, as a rule, it does well enough in the open air all the year. Bunch grass furnishes all the elements of nutriment necessary for bone, muscle, and flesh. It is as strong as oats or barley, and in its perfection will supply the animal with as much nourishment in a day as the quantity of timothy, clover, or hay it may eat in the same time, with the usual amount of grain added. The animals fed on this bunch grass are well rounded, hard and solid in flesh. In bunch grass pastures rye grass grows on lowlands and hillsides. It makes excellent hay when well cured and yields heavily. Stock will not eat it on the ranges, however, except when severe winters come, then they pass through the cold weather nicely on the long stems that stand above the snow. All through the bunch grass region the smaller grasses cover the ground between the clumps of larger growth. The stock ranges of Baker, Malheur, and Grant counties are among the best in the west. Cattle have grazed in some of these valleys for more than 20 years without other food than that obtained by them on the ranges, and have never suffered serious loss. Running water is abundant in the streams fed constantly by living springs and melting snow of the mountains; hence, stock does not suffer for lack of water during the driest season. The largest owners of horned stock are improving its quality by infusing fine blood into the herds. There are numerous breeders of Shorthorns, Galloways, Polled Angus, Ayrshires, Herefords, Holsteins, Devons, Alderneys, and Jerseys of pure race. The large introduction of fine blood into the cattle herds of Oregon, has wonderfully increased their value and greatly added to the profits of the business.

HORSES AND CATTLE.

Published in the Oregonian, January 1, 1898.

Oregon has 200,520 horses and 551,743 cattle. By counties the totals are:

Counties.	*Horses.*	*Cattle.*
Baker	10,000	30,000
Benton	2,050	3,700
Clackamas	5,500	12,500
Clatsop	800	4,000

HORSES AND CATTLE—CONCLUDED.

Counties.	*Horses.*	*Cattle.*
Columbia	1,349	4,076
Coos	2,023	11,918
Crook	10,500	40,000
Curry	1,500	10,000
Douglas	5,962	17,068
Gilliam	8,601	8,514
Grant	6,737	105,454
Harney	10,000	55,000
Jackson	4,000	15,000
Josephine	1,400	4,190
Klamath	5,500	20,000
Lake	12,000	6,500
Lane	7,630	20,000
Lincoln	850	4,172
Linn	10,000	20,000
Malheur	12,283	26,371
Marion	11,000	24,000
Morrow	4,856	4,317
Multnomah	3,665	6,646
Polk	6,105	6,981
Sherman	5,613	2,418
Tillamook	1,100	8,869
Umatilla	16,863	13.919
Union	10,537	27,415
Wallowa	7,475	15,752
Wasco	4,529	6,583
Washington	4,526	8,432
Yamhill	5,566	7,928
Totals	200,520	551,743

The horses are easily worth an average of $15 per head, or a total of $3,007,800. A few years ago horses were not worth their feed. Cattle are worth an average of $16 per head, making the total for the state $8,827,568. Total for horses and cattle, $11,905,568.

OREGON'S DAIRY INDUSTRY.

By W. W. Baker, State Dairy and Food Commissioner, Portland.

Notwithstanding the dairy industry in the United States, when reckoned from an industrial and financial standpoint, exceeds any other single industry, but few people give it any heed or value as a resource.

Oregon, without any question, possesses many important natural advantages over any other portion of our country. Our equable climate not only corresponds with the requirements of butter and cheese-making, but it guarantees the growth of green feed nearly the year round, as well as saves much food required to keep up animal heat as compared with the cold climates east of the Rocky mountains.

The healthfulness of our dairy stock is unequaled by any state in the Union. The environments so completely correspond with animal nature that no dairyman nor stockgrower need have any fears of retrogression, while on the other hand every one is assured that in obedience to that invariable natural law there will be a continuous improvement. Our foundation dairy stock traces to the best dairy strains. W. C. Myers, W. S. Ladd, D. C. Stewart, Capt. J. T. Apperson, ex-Governor Z. F. Moody, Hon. T. H. Tongue, D. H. Looney, A. Bush, and others spared neither money, judgment, nor time in getting the best Jersey, Holstein, Guernsey, and Ayrshire stock from the east; others, namely, W. S. Ladd, Thomas Cross, W. Chalmer, Alex. Chalmer, Fred Shoemaker, W. J. Snodgrass, Hon. George Chandler, James Richardson, W. W. Baker, and others brought from the best breeding farms in America the best Shorthorn milk strains. Judicious crossing has without any question produced a dairy stock that cannot be surpassed, if equaled, as proven by the fact that the Oregon milk averages the year round one pound of butter to every 22 pounds of milk. This superior yield of butter fat must be credited to breed and favorable conditions, and not to our superior feed, for it is now a settled point that feed, while it improves the animal and increases the volume of milk, does not increase the percentage of butter fat in milk.

In a few localities ensilage has been quite successfully introduced, but it is my judgment that this quality of food is not necessary, as by well directed crop-growing, green feed can be grown nearly the year round. Oregon is a land of grasses, and is inviting intelligent energy to make her the equal of England, Scotland, Switzerland, or any other country in root culture, which will greatly increase the dairy industry as soon as once fairly tested.

Our grasses, native and domestic, as well as clover, are abundant wherever and whenever cared for. Timothy, orchard grass, blue joint, blue grass, velvet, and mesquite, besides many other less important varieties, all flourish as though they were brought into existence especially for this land. The clover—red, white, alsike, alfalfa, and some others—flourish on a large percentage of our lands. Corn for fodder, peas, rape, vetch, the thousand-head cabbage, as well as winter oats, all grow here as though it were a duty they owed to the industrial world. All that is lacking is intelligent energy, coupled with practical-science knowledge of dairying.

But few localities in Eastern Oregon are adapted to extensive factory dairying, but the western portion is capable of more than trebling the present industry. The more important districts are to be found on one or both sides of the Columbia river from the Cascades to its mouth, a distance of 130 miles. The north side of the Columbia river, although in Washington, is referred to for the reason that about all the dairy products of that section are marketed in Oregon. The acreage of the Columbia river bottom lands, which include many valuable islands, may be computed by hundreds of thousands; and when it is understood that all this vast dairy district is supplied with daily transportation to the principal markets, they are all the more valuable.

The coast counties, which extend from the California line to the Columbia river, a distance of 260 miles,—namely, Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos, and Curry,—are, I was going to say, in and of themselves a dairy empire unequaled anywhere. The acreage of dairy lands in these counties extends from the coast from 1 to 30 miles in width. The climate along the coast as well as on the Columbia river and throughout the Willamette valley being governed by the warm East India or Japan current, is so invigorating that it is not out of place to say that in this we find the mother of our everlasting green fields, the gateway to prosperity to all who are willing to join nature's good offers.

Leaving the vast dairy districts along the Columbia river and the Coast counties, it is well to not overlook the Willamette valley. The valley counties are not favored with the native grasses as are the districts already named. In these counties, however, the domestic grasses, clover, corn for fodder, peas, rape, vetch, the thousand-head cabbage, and winter oats do flourish as though they had been introduced here for a purpose, and that they intend to do their part well. That dairying is and can be made profitable in the Willamette valley we have only to refer to the fact that already Linn county now has 4 factories, Marion 8, Multnomah 3, Washington 20. The other valley counties have as good advantages as the ones here named, and all that is wanting is intelligent energy.

Up to the present time our dairy product supply has not been equal to the home demand, for each year there is considerable butter and cheese transported here from other states. Prices have been well sustained since the passage of our state dairy and food law. The enforcement of this law keeps out of our markets oleomargarine, butterine, and other imitation dairy products. This amounts to fully 5 cents a pound protection to our pure-butter makers, and fully 2½ cents a pound to the cheese makers. Allowing that one half of the butter and cheese produced is sold by the producers to home consumers, we find that the protection on that which is sold aggregates $211,076. These figures are based upon the following facts: In 1897 Oregon produced 7,998,701 pounds of butter and 888,744 pounds of cheese. Multiply the number of pounds of butter by 5 cents and the cheese by 2½ cents and we find the protection amounts to the sum given above.

Reference as to the benefits of the enforcement of our state law is made with a view to encourage persons to engage in dairying, for certainly protection on butter is as legitimate as protection on wool, hops, or any other product, and will encourage production. Suppose that the state law were repealed, imitations would be "dumped" on our market by the carload, and this would not only shut down our factories, but every dollar paid for the imitations would go out of our state.

The outlook for the industry is certainly encouraging, for it is now generally conceded that the Alaska demand will even this year more than double the supply. I feel warranted, therefore, in saying that there never was better prospects offered a people who are willing to work to "keep their plates right side up" than here.

SHEEP HUSBANDRY IN OREGON.

By John Minto, Salem, Oregon.

There are three different conditions under which sheep are kept in Oregon.

1st. As a part of grain farming.

2d. As aids in clearing fern, brush-covered foothills, and mountain lands.

3d. In flocks of 1,000 or more for the income direct from the sheep in increase, meat, and wool. This last method is confined almost entirely to the east side of the Cascade range.

For the first purpose a substantial shed well boarded up, the south side and the other sides high enough to be a thorough protection against dogs. This shed should be so located as to be most convenient as a general threshing floor, and the straw and chaff barn filled at the west end, with ample room for the sheep around the south, east, and north sides of the straw and chaff. The shed should be within and part of an inclosure of an acre or more protected by dog proof fences so that the sheep may lie in, or outside the shed in mild weather. Thus secured at night, a lot of from three to five acres of early sown winter wheat, rye, or crimson clover. into which early-lambing ewes can be easily let run from the shed, the farmer for wheat might safely count on the full value of his little flock of sheep annually as profit, as it would do him sufficient service in keeping down weeds and turning them into manure to amply pay for his care.

For Western Oregon I would recommend the Cotswold and Leicester for lowlands, and Shropshires for hill farms, and the latter crossed with Merino for dry mountain ranges, especially on rough brush and fern-covered lands. On these again, the money received from sales might be counted profit.

The foregoing is for the Willamette valley and the west slopes of the Cascade range—the Umpqua and Rogue River valleys—anywhere else 50 miles from the ocean.

Along the west side of the Coast range the Shropshire, or a cross bred with it, and some hardy breed like Cheviot or black-faced sheep of Scotland,—if a British breed was looked to as improvement,—might do, but I should advise a homebuilder on these seacoast lands that have had the humus consumed out of them by the awful fires which killed such fine tracts of timber 50 or more years ago, to start with crossbred sheep as near the location of his settlement, as he could get strong sheep with compact fleeces. These burnt lands near the ocean produce a very fine flavored mutton from their mixture of shrub, brush, and grass growth, and would be great helpers in clearing, if well managed.

I adopt the Oregonian statement of the number of sheep in Oregon on January 1, 1898, as more reliable than the assessment rolls which do not show the lamb increase:—

WOOL AND SHEEP.

Statistics, prepared especially for the 1898 New Year's edition of the Oregonian, show the number of sheep in Oregon to be 2,167,241, distributed among the various counties, as follows:

Baker	70,000
Benton	16,154
Clackamas	15,000
Clatsop	700
Columbia	1,146
Coos	7,760
Crook	320,000
Curry	25,000
Douglas	31,218
Gilliam	150,000
Grant	272,987
Harney	72,000
Jackson	25,000
Josephine	523
Klamath	12,000
Lake	180,000
Lane	25,000
Lincoln	4,516
Linn	50,000
Malheur	100,343
Marion	30,000
Morrow	206,208
Multnomah	1,833
Polk	33,098
Sherman	39,670
Tillamook	1,728
Umatilla	205,531
Union	35,195
Wallowa	80,029
Wasco	123,529
Washington	7,127
Yamhill	23,951

The sheep are worth, on the farms and ranches, an average, at a very reasonable estimate, of $2.25 per head, making the total value of Oregon sheep $4,786,292.25.

WOOL CLIP.

The Oregon wool clip for 1897 was 15,706,356 pounds, as follows:

Baker	600,000
Benton	135,000
Clackamas	75,000
Clatsop	4,000
Columbia	5,500
Coos	38,000
Crook	2,500,000
Curry	125,000
Douglas	225,000
Gilliam	1,500,000
Grant	2,000,000
Harney	300,000
Jackson	150,000
Josephine	2,000
Klamath	110,000
Lake	1,500,000

Lane	100,000
Lincoln	20,000
Linn	300,000
Malheur	800,000
Marion	100,000
Morrow	1,600,000
Multnomah	6,000
Polk	187,106
Sherman	200,000
Tillamook	8,750
Umatilla	1,747,000
Union	228,000
Wallowa	500,000
Wasco	300,000
Washington	40,000
Yamhill	300,000

The wool is worth an average of 10 cents per pound throughout the state, making the total value $1,570,635.60.

RECAPITULATION.

Sheep, 2,167,241 head, @ $2.25	$4,876,292 25
Wool, 15,706,356 pounds, @ 10 cents	1,570,635 60
Total for sheep and wool	$6,446,927 85

An examination of these tables will show less than 300,000 sheep now kept in Western Oregon. In my judgment there is no more safe general line of farm economy than to increase the number to 1,300,000. Every grain farm should carry one sheep per acre.

The flocks of Eastern Oregon could be greatly increased if the United States would put the unsold public lands into the care and management of the state; and allow the latter to develop the improvement of the irrigable lands as well as protect the forest growth where it is found beneficial, or where it is the product of highest value. Every acre of soil in Eastern Oregon which by irrigation can be made to produce three to four cuttings of alfalfa hay, secures the reasonably safe wintering of 100 head of sheep for each one and one half tons of hay harvested—that is, a single acre of irrigable land in Eastern Oregon which can be made to produce from four to seven tons of alfalfa hay per annum, will furnish winter feed for from 200 to 400 sheep, and when added to what the stock can get from that range within traveling distance of the winter ranch, would carry them through the winter handsomely. This being true, the wisdom of a land policy recommended by Hon. Elwood Mead, state engineer of Wyoming, is a wise one for the further development of all the arid land states, as in those states, as in Eastern Oregon, the small water courses are already covered by private ownership, one homestead often being made to include more than a mile of such a stream, leaving from 80% to 95% of adjoining area of public land yielding no income to the nation, and little to the state to what it might do if it could be put into private control and interest given to improve it by irrigation where possible, and with arid land grass seeds and browsing plants where irrigation is impracticable.*

POULTRY INDUSTRY.

By George D. Goodhue, editor Oregon Poultry Journal, Salem.

Oregon, with its mild and salubrious climate, is destined to become, within a few years, a poultry producing state. The dreaded cholera of the eastern states is unknown to Oregon poultry raisers. The usual care given to poultry will insure the poultry raiser against the many dreaded diseases that are a constant menace to success.

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* Since the foregoing was written, a year ago, the writer was offered a small lot of 40 head of sheep at the price of $1.50 per head, and bought them. The wool clip from the sheep sold for $61.80, and 28 of them being ewes, there are 30 good lambs as increase—now worth, at moderate valuation, $60 more.

The many advantages of poultry raising in Oregon must be known to be appreciated by those who are engaged in a business which requires large expenditures in properly caring for fowls. Our climate is so mild in winter that it does not require the expensive poultry houses which are built in the east for protection against frost. Our houses may be built of common boards, 1 inch thick, with joints battened with lath or a 2 inch strip. A plain shingle roof will complete the house. In Oregon it is rarely that fowls are kept housed as a protection against cold. Many of our farmers and poultry raisers who have ample range allow their fowls to subsist almost entirely by forage on the farm; giving them only a light ration night and morning through the winter months. During the greater part of the summer months, when unlimited range is allowed, no food whatever is required. Low cost of food, made so by the advantages of free range for the fowls, and the inexpensive housing required, make two very important factors towards profitable poultry raising here. Our transportation facilities are such that it does not become necessary to engage in the business near our large cities, where lands are always high. One may go back from the valleys near the foothills and mountains and buy lands suitable for poultry raising for from $5 to $12 per acre. Such land as is here mentioned is not a barren waste, for it will produce equal to our valley soils. It is rough and hilly, making it more difficult of cultivation. The cost of keeping fowls on such lands is reduced to a minimum. Ordinarily, it costs the average farmer of our valleys about 60 cents a year to keep a single hen, but upon these foothills it is possible to reduce the cost of feeding as low as 40 cents per fowl. All these cheap lands are adapted to the raising of all kinds of cereals and vegetables, and these can be grown and converted into poultry and eggs, and large profits realized.

THE MINING INTEREST OF THE NORTHWEST IS CREATING AN IMMENSE DEMAND.

No section of country in the United States is a more inviting field for systematic and profitable poultry raising than Oregon is. The recent gold discoveries in the Klondike country and in Alaska, added to the recent great discoveries in almost every range of mountains of the Northwest, together with mines that have existed for years, but which have more recently been largely capitalized for the purpose of extensive development, have opened up a new field for the consumption of farm products. These great mining regions, not being an agricultural country, must draw upon the resources of other countries for their food supplies, and Oregon will, from its situation and its adaptability to the production of everything in the food line required by the miner, become the central depot from which these supplies will be drawn. In poultry and eggs, the miner of the north can be more advantageously and cheaply supplied from Oregon than from any other section. It will require hundreds of thousands of fowl and millions of eggs to supply this demand. There are opportunities to engage in profitable poultry raising in Oregon that will bring back to those in the business safe and sure returns.

Up to the present time, poultry raising here has been a makeshift of the farm, a sort of toleration as it were, of a few mongrelized fowls kept to supply the home table with an inferior and scant supply of chickens and eggs. Proof of this statement is amply furnished by the shipment of Eastern eggs in carload lots to the different market centers of the state to supply the egg demand. Oregon pays annually over $350,000 for Eastern eggs, and the demand grows greater each succeeding year. These conditions do not exist because Oregon is not adapted to successful poultry raising, but because our producers have not been brought to face the necessity of engaging in the business in a systematic and practical manner. What Oregon needs is more experienced and systematic poultry raisers, who will raise better poultry and more of it. For such there is ample room, and the business can be made one of large profit. To those who wish to engage in poultry raising on an extensive scale, Oregon is an inviting field. While the demand has always been greater than the supply for good poultry and eggs, yet the great stimulus now being given to the mining industry and the large emigration turning westward to every section of the Pacific coast must cause much greater demand in the future. Our cities are rapidly increasing in population, and new mining towns are springing up in the many mining regions over the North Pacific coast. Factories and mills have increased their output, and doubled their working forces, and many enterprises are under way and contemplated, which must, from the natural course of events, create a greater demand and consumption for all poultry products.

Poultry in this state will almost support itself for one half of the year. Green foods are abundant the whole year, and do not have to be stored and fed during the winter months, but instead the fowls can be allowed their liberty and a free range during the winter months, thus lessening the cost of keeping. As has been stated previously, 60 cents a year for each fowl is the extreme average cost of keeping. With careful management, good hens will produce from $1.50 to $2 each year in eggs. In egg production, Oregon hens are far behind the consumption, and good, practical poultry raisers are needed here in large numbers to supply the shortage. Of the inferior grades of poultry for market purposes, this state has a surfeit. The market centers always have an over-supply, and the inferior grades are ever begging purchasers at from $1.50 to $2 per dozen. Good, heavy-weight, and well-fattened poultry is always in demand, and commands from $5 to $8 per dozen. Raising poultry for market is fully as profitable as raising poultry for eggs.

EVERY SECTION OF THE STATE SUITABLE FOR POULTRY RAISING.

Most every locality of Oregon is well adapted to poultry raising. That section lying between the Coast and Cascade mountain ranges, more particularly that part of the state drained by the Willamette river and its tributaries, and also the southern part of the state between the Coast and Cascade ranges is possessed of a very mild and salubrious climate, and is a veritable poultry raising paradise. The market, and transportation facilities, too, are all that could be desired.

San Francisco draws largely its poultry supplies from Southern Oregon, and that city alone is a constant consumer of Oregon poultry products, of which she seems never to cease demanding, and never supplied, at prices always profitable to the grower. Then, too, the Southern Oregon grower is called upon by the cities of the north, of which Portland, Oregon, is a vast consumer and shipper also to the many great mining regions farther north. The poultry raiser of the Willamette valley is in the very heart of the surrounding market centers and is not dependent upon any single market for his surplus, but can ship to many, thus always taking advantage of those market centers which offer the best prices.

In Southern and Central Oregon an inviting field is open for turkey raising. The hilly and mountainous regions of this section are peculiarly adapted to this branch of the poultry industry, and it is not uncommon to see flocks of 1,000 or more ranging at will over the beautiful rolling hills of this part of Oregon. Turkey raising in Southern and Central Oregon is an industry that must assume great proportions. The great advantages found in this section consist chiefly in the cheap food supply. Grasshoppers and insects are the sole food of the turkey from May to October, and the turkeys of that section are raised and fattened at little expense to the owner. On an average, the turkey, from the time it breaks the shell until it reaches the market in the fall, does not consume to exceed one-half a bushel of wheat, and the cost may be safely set down at not to exceed 30 cents each. Turkeys are never below 9 cents per pound live weight, and they frequently go as high as 15 cents. The principal market centers for the turkey of Oregon production are Portland, San Francisco, Tacoma, Seattle, and Spokane. All of these cities are large consumers of poultry, and the best fowls are always in demand at profitable prices to the grower.

In the Willamette valley, where diversified farming is more extensively engaged in than formerly, and where many of the larger grain and stock farms are being subdivided into smaller tracts, and more skillfully tilled by energetic and thrifty farmers, poultry raising must in time become an industry of great proportions.

The skilled poultryman of the East may engage in any branch of poultry raising here, including any of the numerous breeds of chickens, turkeys, ducks, and geese. The transportation facilities for reaching the markets quickly and at moderate freight charges are all that could be desired.

EASTERN OREGON.

What has been said of Western Oregon's advantages regarding adaptability, market advantages, transportation facilities, climate, soil, etc., regarding profitable poultry raising, is equally true of Eastern Oregon.

This great Inland Empire is surrounded by large mining industries, populous cities rapidly growing and new enterprises springing up on every hand, which are all calculated to cause an ever-increasing demand for poultry product. The lands of Eastern Oregon are to be purchased at very moderate prices, and being mostly of a dry and sandy nature are peculiarly adapted to the health and rapid growth of the whole fowl kingdom. The winters are not so mild as those of Western Oregon, but the soil is much drier, which is one of the essentials to the raising of healty and vigorous poultry.

As a food, wheat is the standby. It produces eggs and meat of superior flavor. For feeding purposes, corn is produced here as successfully as in many of the corn states, and during the winter months it is fed extensively by many of our poultry raisers, but wheat is the best for egg production.

During the past year or two, greater interest has been manifested by the producers in supplying better poultry and more eggs to meet the ever-increasing demands of the Northwest consumption, and rapid development has been made in the right direction. But the field for improvement and increase of better poultry is wide. Oregon needs "new blood" in poultry culture.

POULTRY RAISING IN OREGON.

To the fancier of the eastern states who may hesitate to come to Oregon, fearing that here he may not meet the cultured fancy, and fail to find those here who appreciate the beautiful in the fowl kingdom, let him not be deceived. Oregon breeders are up in the front ranks in the production of fine feathers and fine fowls, and no country can show a larger per cent. of breeders of fine poultry than this state.

Numerous poultry organizations have been formed in various parts of the state during the past two years, and the poultrymen sustain a strong and well-organized state association, which holds annual poultry exhibitions in Portland and other parts of the state. These organizations are productive of great good in fostering the industry by creating greater interest in better poultry.

PHEASANT RAISING IN OREGON.

Coupled with the poultry industry of Oregon, and one of great moment, is that of pheasant raising. The great Willamette valley is the paradise of the famed Denny or ring-necked pheasant. That the climatic conditions of the valley are favorable to the rapid propagation of these pheasants is proved by the thousands and tens of thousands growing in their wild state all over this valley. If some of the more enthusiastic pheasant-raisers of the east, who have spent large sums of money in the vain endeavor to make the business successful, will relinquish the business there and engage in the same calling here, they will very soon discover that Oregon is the greatest and only successful Chinese pheasant-producing country in the western hemisphere. A thousand dollars invested in a pheasant-raising plant anywhere in the Willamette valley by an experienced pheasant-raiser will, within a few years, lay the foundation for a snug fortune.

MANUFACTURING.

The two essential elements of profitable manufacturing—the cheapness and abundance of raw material and fuel—exist in Oregon to a marked degree. Another of equal if not greater importance also exists; that is, an abundant water power, in which no other state in the American Union is better supplied. The falls of the Willamette at Oregon City could supply sufficient power for the entire industry of a community with a larger population than that of the whole state at present. The entire volume of the river here falls over a ledge of rocks 40 feet high, and the surroundings are peculiarly suited to its utilization. The water power of Salem ranks next to that of Oregon City, it being obtained by means of a canal leading the waters of the Santiam river into the bed of another small stream, and thence to Salem. It is estimated that the power thus provided is equal to that of Lowell, Massachusetts. There is also considerable power at Albany, Harrisburg, and Eugene. At Springfield, three miles above Eugene, great power is furnished by the middle fork of the Willamette. The other two forks of the Willamette also afford vast power. The Tualatin supplies great power, and the Yamhill, Rickreal, Luckiamute, Mary's river, and Long Tom also afford considerable water power. The water power on the Upper Columbia is very important, and at the Cascades, sixty miles from Portland, the river has a fall of 40 feet, from which power could be supplied to mills for miles on each side of the river. A number of tributaries of the Columbia, such as Sandy, Hood, and Des Chutes rivers, and Mill Creek, furnish power. In Southern and Southeastern Oregon power is obtained at Ashland and on Link river, which connects the Upper Klamath with Lower Klamath lakes. The power on the latter is supposed to equal that of Oregon City. At several points in Oregon some of the smaller streams have falls of from 100 to 500 feet, which could be utilized. In fact, there is hardly a corner of the state in which the cheapest of all powers does not exist in almost unlimited amount. The climate permits of all kinds of labor, indoor and outdoor, at all times of the year. There is iron, wood, and coal in abundance, and all the other materials are found, while the superficial conditions are favorable.

Next to the lumbering industry, probably the most important is the manufacture of woolen goods, which has attained a high degree of perfection. The most important woolen mills are located at Salem, Oregon City, Albany, Brownsville, Dallas, and Ashland. The cassimeres, flannels, and blankets manufactured in these establishments are of a superior quality, and find ready market both at home and abroad. There are numerous first-class flouring mills in the state worked mainly by water power. Ship building has been followed for sometime with success at different points on the Oregon coast, and a number of fine vessels built there are now afloat. Not far from the iron mines near Oswego, described in the chapter on mines and mining, a furnace and a foundry on a large scale have been in operation for years. The pig iron turned out by the furnace is of superior quality, and is sold in the home market, as well as in San Francisco, where it is deemed equal to Scotch iron. A paper mill near Oregon City produces thousands of pounds of straw and other paper daily. Wood pulp is manufactured at Oregon City. For a full description of such manufacture see the article on Clackamas county. There are a number of factories where woodenware is produced. Hemlock and oak bark are obtained in vast quantities, hence a number of tanneries are in operation. Several establishments are in operation for the manufacture of agricultural implements, and there is at least one well-equipped carriage factory. Furniture of all sorts is manufactured from native woods. Although these manufacturing industries are scattered all over the state, Portland being the general center of trade and transportation, and the chief seat of population, is the manufacturing center of the state, and already the bulk of the manufacturing is here.

The manufacture of flour has grown to be one of the most valuable industries in the state, the surplus furnishing cargoes for large ships to China, Japan, and European markets. A factory for the manufacture of beet sugar is now in course of construction at La Grande, Union county, and others are being projected.

EDUCATION IN OREGON.

By J. T. Gregg.

Fertility of the soil, timber, resources, water supply, power, and means of inter-communication, nature and extent of grasses and grazing, mineral deposits, climatic conditions, and healthfulness are valuable and interesting subjects for consideration by any person who contemplates removing to another state for the pupose of making for himself a home. These subjects pertain more especially to the physical requirements of mankind, but in this day and age of the world man deems his spiritual and mental welfare entitled to as careful and serious a consideration.

The good citizen who has concluded, for various reasons, to seek some other state in which to build his future residence, will give due attention to each of the foregoing features, and will also inquire particularly into the customs and conditions of the people, the laws by which they are governed, and the religious and educational advantages with which they are provided. He is an industrious man; hence he wants to live in a busy, thriving community. He is a law-abiding man; therefore seeks that state in which the laws are wise, just, humane, and are faithfully and judiciously administered. He is a good man; therefore desires to associate with people who have a proper regard for morality, integrity, and Christian duty. He is an intellectual man; consequently he knows the value of education, as the surest means of aiding mankind in the pursuit of happiness and securing to each individual the blessings of liberty.

The people of Oregon will accord a hearty welcome to all men who come with the qualifications and intentions of good citizens; and, more, they want them to come, to make this their home, and to aid the progress of this young state in all lines of enlightened and substantial advancement.

It is my purpose to give a brief account of education in Oregon, which, for want of space, must be confined to the most salient features of the system.

The superintendent of public instruction is the head of the system. He is elected for four years, and is a member of the state board of education in conjunction with the governor and secretary of state. This board has power to make rules and regulations, conforming to law, for the government of public schools, and, with the state board of examination, to issue certificates and diplomas to teachers. The superintendent has charge of the entire work, and is required by law to visit every county in the state at least once a year, in the interest of education. He is required to hold institutes in each judicial district biennially, and each year a state teachers' association, at all of which he presides, and where lectures and approved instructions are given teachers who are employed in the public schools. Each county is provided with a superintendent, whose term of office is two years. He has entire charge of the school work of the county, and in conjunction with a county board of examination issues certificates to teachers. He is required by law to hold institutes within his county at least once a year, at which he presides, where approved instruction is given teachers who are employed in the public schools, and who are required by law to attend.

The counties are divided into districts, each of which is organized by the election of three directors and a clerk. Directors hold office 3 years, the clerk 1. In districts containing 10,000 inhabitants or more, there are five directors, whose term of office is 5 years each, and the board is empowered to choose its own clerk, and to appoint a superintendent for the district. It is the duty of the directors to employ teachers, and to do all things necessary for the successful conduct of the schools under their supervision.

The law provides for a uniform series of textbooks, not liable to change oftener than once in 6 years. The county superintendents and a cetain number of prominent educators, appointed by the state board of education, are constituted a commission to select the textbooks required.

The public schools of the state are supported from the proceeds of a 5-mill tax, levied by each county upon its taxable property, and by the interest derived from the irreducible school fund. In many of the larger dristicts—especially those in which the cities are located—an additional special tax is levied upon the property of the district by the resident taxpayers. The irreducible school fund is created from the sale of the 16th and 36th sections of the public domain ceded by congress to the state for school purposes, and of all moneys which shall accrue to the state by escheat or forfeiture, money paid for exemption from military duty, proceeds of all gifts, devises and bequests made by any person to the state, the proceeds of all property granted to the state, when the purpose of such grant is not given, and the proceeds of 500,000 acres of land granted the state by act of congress, approved September 4, 1841. This fund has now reached the sum of $2,472,029.69, all of which is loaned on good real estate security at 7% and 8% per annum, interest payable semi-annually. This income is apportioned, at least once each year, among all persons of the state between the ages of 4 and 20 years. The 5-mill county tax is likewise apportioned among all the persons of the respective counties between the ages of 4 and 20 years. The county superintendent receives the money in each case and distributes it to the clerks of the different districts.

A state university has been established, provided with capacious and beautiful buildings, thoroughly equipped with all modern conveniences, a voluminous and well-selected library, apparatus, instruments, and all things necessary to successfully conduct a school of high order, and to prosecute satisfactorily all studies of a technical and scientific character. Its curriculum embraces a classical course, a scientific course, a literary course, an English course, and a business course. At a late meeting of the regents the grade of the school was advanced one year, making it on an equality with the Michigan state university. The chairs of music and elocution were created, and a course of civil engineering was established. The faculty is composed of educators distinguished for their profound scholarship and eminent literary attainments.

The agricultural college has long been one of our state institutions. It has suitable and commodious buildings, a good library, ample laboratory, a choice, well-selected and extensive herbarium, and other appliances needed in such a school. The United States makes it an annual appropriation with which to conduct an experiment station. Investigations and experiments are made and the results published in bulletins, which are distributed throughout the state by the school. Last year bulletins were sent out, among others, covering the following subjects: Horticulture and chemistry, zöology, small fruits and vegetables, varieties of wheat and flax, silos and silage, grasses and potatoes, strawberries, sugar beets, Oregon weeds, pig feeding, the soils of Oregon—this bulletin contains general information as to soil and composition. There is also given an outline of the topography of the state and comparative and tabulated analyses of 28 characteristic Oregon soils, mostly from the Willamette valley, together with the natural vegetable and physical properties of each sample. The bulletin relating to sugar beets in Oregon is a continuation of the experiments begun in 1891. The bulletin contains comparative climate tables, showing the conditions under which the experiments were made. Thus, in each bulletin, the subject is treated from all standpoints pertaining to inquiries which would naturally be made by the intelligent agriculturalist. What is here said gives but a faint idea of what all these bulletins treat, but is mentioned simply to indicate the scope of the work and the inestimable advantages to be derived from the investigations of this valuable institution. There are three general courses—the agricultural, the mechanical, and that of household economy; and a line of study is adapted to each. All these look forward to the preparation of the student for some business industry. While the college is especially devoted to giving instruction in all lines of agricultural and mechanical development, it is also provided with a literary course, which gives its students a good English education, and prepares them for the duties and responsibilities of good citizenship. The faculty is strong, each member being peculiarly adapted to his special line, and all things considered, the school ranks well up with the best of its kind in the Union. The college farm embraces 178 acres of good land, under a high state of cultivation, a large part of which is employed for purposes of experiment, investigation, and demonstrations. The school is supported from the appropriation from the government, from the interest on the agricultural fund, which is derived from the sale of land ceded to the state for that purpose, and from annual state appropriations.

There are five normal schools in Oregon receiving state aid and managed in accordance with appropriate laws on that subject. Each is provided with good buildings, a library, appliances, etc., and a thorough, comprehensive course of study, which will train students for the profession of teaching. Each has an able corps of instructors, who are scholarly and well trained to teach teachers how to teach. These schools are doing a good work for the state, by placing within reach of the people capable, well trained, and enlightened instructors, who are constantly finding their way into the common schools.

At the capital the state has established an institute for the blind, a school for the deaf, and a reform school. Each of these schools is supported entirely by the state, and is conducted upon the broadest and most approved principles known to those branches of education. Each school is provided with suitable buildings, comparing favorably with structures for those purposes in other states, while the management is broad, thorough, efficient, humane, and successful.

In every town and city there is a good system of graded public schools in session 9 months of the year, and in every district throughout the state the public schools are in session from 4 to 10 months during each year. In many country districts the schools are carefully and properly graded, and all of them are supplied with competent, earnest, and progressive teachers. The people take a commendable pride in their public schools, hence they have constructed good buildings, neatly furnished, and most of them are supplied with maps, charts, globes, etc., and in many instances well selected libraries are established.

The public schools of Portland are especially worthy of commendation. The course of study extends from the primary to the high school. There are nine grades, exclusive of the high school course. The following branches are taught in the high school: Algebra, higher algebra, bookkeeping, chemistry, geometry, German, civil government, English grammar, ancient, mediæval and modern history, English literature, Latin, physics, physiology, and rhetoric. These schools employ 228 teachers, exclusive of supernumerary and pupil teachers. The board of directors consists of five members, who have the entire management of the schools and appoint a city superintendent, who supervises the grade work, examinations, promotions, etc., subject to an excellent code of rules provided by the board.

The foregoing refers especially to public school matters, and I will now call attention to some of the most important colleges and universities of the state.

Albany college, of Albany, Linn county, was founded by the Oregon Presbytery. The course of study extends through 4 collegiate years, and embraces philosophy, history, language, literature, and science. It is provided with fine buildings, well equipped. Bishop Scott academy, at Portland, is a military school for the training and education of boys and young men. It is an elaborate institution, and prepares its students for any college or scientific school, or for business. It is under the management of the Episcopal church. McMinnville college is located at McMinnville, Yamhill county. The course of study embraces the normal, literary, scientific, and classical. Mount Angel seminary and college is located at Mount Angel, Marion county, and is under the management and conduct of the benedictine fathers. Course of study: Preparatory, classical, and commercial. French, German, natural philosophy, chemistry, telegraphy, drawing, and music are taught. Philomath college, at Philomath, Benton county, is an institution for both sexes, under the control of the Oregon conference of the United Brethren church. The course of study includes English preparatory, academic preparatory, normal, scientific, and classical.

Portland university is an institution located within the corporate limits of the city of Portland. It is provided with good buildings and ample grounds. The course of study is: *First*, the classical course of four years; *second*, the Latin and scientific course, four years; *third*, literature and art course, four years. St. Mary's academy, at Jacksonville, Jackson county, is especially for young ladies. St. Mary's academy for young ladies, at The Dalles, Wasco county, is especially for young ladies. Tualatin academy and Pacific university are located at Forest Grove, Washington county, and are under the direction of the Congregational church. Tualatin academy was founded in 1848, and Pacific university was founded in 1853, "in order to make it possible for the young people of the Pacific Northwest to obtain a thorough education under Christian influences." Course of study: *First*—Candidates for the degree of bachelor of arts, after pursuing a required course in Greek, Latin, mathematics, history, English, and the introductory study of the sciences through the freshmen and sophomore years, are allowed to elect a certain number of their studies. *Second*—Candidates for the degree of bachelor of science will have the same courses, required and elective, as candidates for the degree of bachelor of arts, except that the place of Greek will be taken by analytical geometry, calculus and advanced work in chemistry and biology. *Third*—The course leading to bachelor of literature is a short course, designed for women who do not wish to pursue the study of Greek, higher mathematics or advanced science. The other required work and the elective courses are the same as the degree of bachelor of arts. Willamette university, located at Salem, was founded by the Methodist church at a very early day in the history of the state, and is the oldest institution of learning in Oregon. It embraces: The college of liberal arts, located at Salem; the college of law, located at Salem; the college of medicine, located at Salem; the college of pharmacy, located at Portland; the college of theology, located at Salem; the woman's college (boarding hall), located at Salem; the art department, located at Salem; the elocution department, located at Salem; the university academy, located at Salem.

The list given below presents the names and location of all the chartered institutions of learning in the state in addition to those above-mentioned, including the universities, colleges, seminaries, academies, and private schools, so far as known:

Academy of the Sacred Heart, Salem, Marion county; Academy of Our Lady of Perpetual Help, Albany, Linn county; Academy of the Holy Name, East Portland, Multnomah county; Ascension School for Boys and Girls, Cove, Union county; Friends' Polytechnic Institute, Salem, Marion county; Grace Church Parish School, Astoria, Clatsop county; Holmes' Business College, Portland, Multnomah county; Independent German School, Portland, Multnomah county; Jefferson Institute, Jefferson, Marion county; Leighton Academy, Cove, Union county; La Creole Academy, Dallas, Polk county; Lafayette Seminary, Lafayette, Yamhill county; Mineral Springs Seminary and Business College, Sodaville, Linn county; Mt. Angel Academy, Mt. Angel, Marion county; Notre Dame Academy, Baker City, Baker county; Pacific College, Newberg, Yamhill county; Portland Academy, Portland, Multnomah county; Portland Business College, Portland, Multnomah county; Santiam Academy, Lebanon, Linn county; St. Helen's Hall, Portland, Multnomah county; St. Mary's Academy, Portland, Multnomah county: St. Michael's College, Portland, Multnomah county; Sacred Heart School, Portland, Multnomah county; St. Joseph's School, Portland, Multnomah county; St. Mary's Academy, Jacksonville, Jackson county; St. Paul's Academy, St. Paul, Marion county; St. John's Academy, Oregon City, Clackamas county; St. Joseph's Academy, Pendleton, Umatilla county; Verboots School, Cornelius, Washington county; Wasco Independent Academy, The Dalles, Wasco county.

It will thus be seen that the people of Oregon have made ample and wise provision for the educational training of their children and have not neglected to likewise provide for an enlightened Christian training.

TRANSPORTATION.

Oregon is fortunately situated with reference to transportation facilities. In the matter of railway communication, there are now in operation roads as follows: The Southern Pacific operates a road from Portland to the Southern Oregon boundary, 358 miles, through the Willamette valley and the southern part of the state. A branch line of the same company, on the west side of the Willamette river, from Portland to Corvallis, 97 miles; and on the east side east of the main line from Woodburn to Springfield, in Lane county, 100 miles along the eastern side of the Willamette valley, and through a rich country. This company also has a branch from Albany, in Linn county, to Lebanon, in the same county, 18 miles, which gives an outlet to a rich and productive section. The Oregon Pacific, from Albany west to Yaquina bay, 83 miles (connecting with a line of steamers running to San Francisco, California), and east to the foot of the Cascade mountains, 40 miles. The narrow gauge, from Portland to Airlie, on the west side of the Willamette valley, and near the foot of the Coast range, 79 miles, through a beautiful and prolific section. The Northern Pacific has about 40 miles of road in Oregon, running north to Goble, opposite Kalama in Washington, where the cars are transported across the Columbia river and proceed to Tacoma and Seattle, and thence east to St. Paul. The Union Pacific has lines from Portland east through the best part of Eastern Oregon to Huntington, 404 miles, and thence east to Omaha. It also has branch lines to Heppner, in Morrow county, 40 miles from Willows, on the main line; another branch from Umatilla Junction to Walla Walla, across the northern boundary of the state; another from La Grande to Elgin, in Union county, 21 miles; another branch from Pendleton to Spokane, across the northern boundary of the state. A railroad from Portland to Astoria, and south of Astoria to the seaside summer resorts, has just been completed. Thus it will be seen there are three different companies operating through lines from Portland, Oregon, to different points in the East, while at the same time the principal portions of the state are crossed by railroads.

The Willamette river is at present navigable at all seasons of the year to Harrisburg, 120 miles from its junction with the Columbia, and a small outlay on the part of congress would make this river navigable to Eugene, Lane county, 138 miles from the Columbia, the entire year, unless it may be for a few weeks during the driest season. The Columbia river is navigable along the entire northern boundary to The Dalles. Above this point occur a series of rapids, around which the government is preparing to build a boat railway. An appropriation has been made to purchase the right of way, proceedings for which are now pending. Work on the railway will soon begin. This will extend the navigation on the Columbia to the mouth of the Snake river, which is navigable 150 miles along the eastern boundary of the state.

Along the coast south of the Columbia are Tillamook bay, Nestucca river, Yaquina bay, Alsea river, Siuslaw river, Umpqua river, Coos bay, Coquille river, Port Orford, and Rogue river, each of which will admit coasting vessels of light draft, while some of them, especially Coos bay and Yaquina, will admit ocean vessels of good size. Most of the streams above mentioned are navigable from 10 to 50 miles inland, thus furnishing a means of water transportation with the outside world. An examination of these natural waterways will demonstrate beyond question that the people of Oregon will always be furnished with competing lines of transportation, thus securing to themselves reasonable rates for fares and freights.

"WHERE ROLLS THE OREGON."

COL. PAT DONAN'S GORGEOUS WORD-PICTURES OF THE PACIFIC SLOPE AND OREGON—PORTLAND AND THE ALASKAN GOLD FIELDS.

In the Philadelphia *Times* of June 6, Louis N. Megargee, one of the most brilliant members of Colonel McClure's editorial staff, has this interview with Colonel Pat Donan in regard to the Pacific slope, Oregon, Portland, and the Alaskan gold fields.

The compact signature of Colonel P. Donan, the unrivaled word-painter, formerly of Devil's Lake, Dakota, but now soaring among the boundless beauties of Oregon, decorates the register of the hotel Lafayette, where he has already succeeded in fascinating Proprietor Smith with his spell-binder accents. Donan is an American of Americans, and when talking upon one of his favorite hobbies he could charm a brass monkey off its pedestal. The narrator ran up against him yesterday, and this is what happened:

"Spin you some wonderful yarn, true or otherwise? My dear fellow, whatever it may be, rest assured it will not be 'otherwise.' Two or three so-called newspapers over in Dick Crokerville, between Hoboken and Hell Gate, are certainly competent to glut the markets of all creation with the 'otherwise' brand of yarns. There is no reason for infringing on their Ananiasy patents, or interfering with their Munchausenish monopoly. One who travels as much as I do, in a world full of wonders, would have to be as blind and stupid a descendant of Balaam's saddle-pony as the average American statesman if he could not any time reel off wonderful yarns enough to put a girdle round the earth and back again, every wild-and-wooly strand and fibre of which should be double-and-twisted truth. I have just come in from a region where wonders all wear spurs to keep other wonders from treading on their heels; a region which is itself a wonder, and whose every feature and characteristic are wonderful; a region in regard to which the simplest, most commonplace truth is stranger than all the fictions of yellow journalism.

"What region? Oh, the Pacific slope in general, and the 'continuous woods where rolls the Oregon' in particular. The new world—and the railroad guide-books—abound with wonderlands. Every well-organized system of railway over 5 miles long keeps at least one full-blown wonderland always on tap. According to the enterprising and ingenious passenger and advertising agents, there are alleged wonderlands in the Adirondack and Allegheny molehills, up on Niagara creek with its little 180-foot riffles, among the catfish brooks and sucker puddles of Wisconsin and Minnesota, and amid the frigid deserts and coyote pastures of Dakota and Manitoba. But the only genuine wonderlands in all the United States, with the capital 'W' blown in the glass, and the autograph signature of God Almighty on every label, lie among the Rocky mountains, or to the westward of them. All the boasted wonderlands on this side of those giant sky-punchers are spurious imitations—mere fresh-air-fund resorts for sick babies and untrained nurses.

"You eastern magi, newspaperites, and magazinists, are in the habit of talking flippantly about the rude and unkempt West; and, of course, I recognize the fact that you are yourselves the radiant incarnations of all knowledge and sapiency, culture, sweetness, and light. As the boily old gentleman of Uz remarked several thousand years ago," 'Doubtless ye are the people, and wisdom shall die with you.' But has it ever struck your admitted omniscience that the Pacific slope—that part of the United States west, lying between the Rocky mountains and the Pacific ocean—has an area of 1,440,232 square miles, or within a trifle of twice as much as all the republic from the Atlantic to the Mississippi? It is enough to make 173 such states as Massachusetts, or 1,152 Rhode Islands. In that mighty domain are all the Pike's Peaks, Shastas, Hoods, Rainers, Logans, and St. Eliases, rearing their eternal snow-crowned crests from 12,000 to 19,500 feet heavenward, while your puny Katahdins, Washingtons, Marcys, and Mitchells, halt at from 5,200 to 6,700 feet, and Mt. Negro, the highest pinnacle in your own state of Billy Penn and Matt Quay, only climbs

2,826 feet toward the skies. All the world-famed abysmal cañons of the Colorado, the Arkansas, the Gunnison, and the Grand, all the Royal Gorges and Gardens of the Gods, and all the geysers and glaciers of the Union are out there. The Yosemite falls—1,800 feet in misty dizziness of height, and Multnomah falls, 850 feet high—are out there; while you rave over Niagara's liquid tumble of 180 feet, and Minnehaha, with its tiny syringeful of water falling 70 feet. The American Dead sea, Great Salt Lake, in whose mysterious waters no living thing—fish, reptile or animalcule—exists, and no human body can sink, is out there; and there are the country's huge mountain treasure houses of gold and silver. One small subdivision of this wondrous realm, the state of California, alone has within the memory of men yet young added to the wealth of the country and the world $1,500,000,000 in gold alone, and fully as much in other products, making a grand aggregate of $3,000,000,000 or nearly one eighth of the total assessed valuation of the United States in 1890! Idaho, which is scarcely known in your Oriental geographies and encyclopædias, turns out one fourth of the entire annual lead product of the United States, and the Pacific slope last year produced in four metals alone—gold, silver, lead, and copper—nearly $150,000,000, or more than half enough to run the whole United States government under any honest and economical administration."

But the entire region is too vast and too varied to be included in any one reasonable talk. Let me limit my chin exercise to a single state. When I had the honor, some years ago, of downing your redoubtable Clover Club for the first time in its brilliantly riotous history, I hailed from Dakota, which was and is a good region to hail from—and hail all the time. I now live in Oregon—when I am there—and it is a true wonderland in extent, scenery, climate, products, and possibilities, as I think you will admit before I let your ears escape. Oregon has an area of 96,030 square miles, or 61,459,200 acres. It is 3,500 square miles, or 2,240,000 acres larger than New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Delaware all put together, with the District of Columbia, the National Capitol, and both houses of congress thrown in for good—or, rather, bad—measure. It is 395 square miles, or 232,800 acres greater in extent than New York, Pennsylvania, and Rhode Island. As thickly peopled as Rhode Island it would maintain a population of 30,729,600, and as densely populated as England it would give habitation to 51,983,024. In grandeur and loveliness of natural scenery Oregon is unsurpassed by any region of the globe. It combines all that is wild, sublime, picturesque, and enchanting in mountain and stream, gemlike island, boundless forests of trees that sweep the skies, crag, cataract, and cascade. Its northern boundary for 300 miles is the majestic Columbia river, the Amazon of North America. Ten miles above its mouth it is 9 miles wide, some distance further up it is 17 miles wide, and nearly 1,000 miles away, by its own devious windings, one of its giant arms, the Kootenai, swells into a wondrous flowing lake from 5 to 10 miles wide and from 800 to 1,500 feet deep. Earth boasts no more transcendently glorious pictures of nature in her loftiest artist moods than are unrolled for 200 miles along this mightly flood where it cuts its way through range after range of the huge Cascade mountain system, which numbers among its jewels snow-clad and glacier-crested Mt. Adams, Mt. St. Helen, and Mt. Hood, the unrivaled monarch of all the mountain peaks in the United States, this side of Alaska. Multnomah Falls, 850 feet high, have been painted and penciled and sung throughout the world, but they are only one of more than 20 cataracts that tumble, flashing and foaming and resplendently iridescent, from the mountain tops within a half hundred miles of Portland. Cardinal Satolli declared the scenes in this part of the Columbia valley surpassed everything he had found elsewhere in America.

"Oregon is a wonderland in climate. Nowhere else on earth, near the sea level and among civilized people, can anything like it be found. There are no extremes. The records of the government weather bureau for 18 years show that the total average range of the thermometer during the year in Coos county is but 13°! Think of that, you folks here, where the mercury sometimes runs the whole length of the tube and back again in 24 hours. From the average maximum of July and August to the average minimum of

December and January, a variation of only 13°! No hot weather in summer, and no cold weather in winter. Flowers bloom and fruits ripen in the open air Christmas and New Year, and one wears light flannels and sleeps under a blanket the Fourth of July. Portland is in the same latitude as Fargo and Bismark, Dakota, where they have to boil the whisky to keep their spirit thermometers from freezing, and where the appearance of the tops of the telegraph poles above the blizzard-heaped snowdrifts in April or May is hailed as a gladsome sign of approaching spring—while at Portland the lawn mowers have been running every month since I was here last fall, and violets, pansies, roses, and jassamines have been blooming all the time. The almonds bloomed in January and the magnolias were in full bloom in March. During the hottest part of last summer, when you easteners were being fricasseed in your own cultured grease at a temperature of from 95° to 110° Fahrenheit, the mercury at the mouth of the Columbia ranged from 60° to 70°. The mean annual temperature of the state is 49°. There are no cyclones and no thunder storms, and it is hardly necessary to add that the United States census figures show that the death rate of Oregon, Washington, and Idaho is the lowest in any part of the Union, being but half as great as in California, and but a third as great as in Massachusetts.

"Oregon is pre-eminently a wonderland in its soil and its products. And here I begin to fear that my reputation as a George Washington hatchet-bearer will suffer. What will you say, or think, when I tell you that in Eastern Oregon and Washington four or five big crops of wheat are harvested from one sowing? It is a fact, and this is the only region on God's green and beautiful earth where it is a fact. Farmers actually harvest three, four, and sometimes five crops of wheat from one seeding. I could give you instances enough to fill *The Times*, but let one suffice. Dr. N. G. Blalock, of Walla Walla, President of the Pacific Fruit-Growers' Association, harvested, from one seeding of wheat, 37 bushels to the acre the first year, 30 bushels to the acre the second year, 20 bushels to the acre the third year, and fifteen bushels to the acre the fourth year—a total of four harvests and 102 bushels to the acre from a single sowing. Nor is this all. Wheat may be sown and harvested every month in the year. It is no uncommon thing to see plowing, harrowing, seeding, harvesting, and threshing all going on in the same field at the same time. You never heard of anything like it before? No, and there are nearly 70,000,000 people in this country who are like you in that respect; but facts are facts, whether new to you or not—and these are facts. With but a one hundred-and-seventieth of the population of the United States, Oregon last year produced a twentieth of the entire wheat crop of the country, and one-sixth of the total wheat exports of the nation went out from Portland, its metropolis. B. F. Northcutt, near Pullman, in Eastern Washington, raised 101 bushels of wheat to the acre, and his crop was one of the notable exhibits at the Chicago exposition. From 50 to 80 bushels of wheat, from 60 to 110 bushels of oats and barley, from 50,000 to 100,000 pounds of carrots and turnips, and from 400 to 900 bushels of potatoes to the acre are ordinary yields. The biggest apples, biggest pears, and biggest cherries at the World's Fair were from Oregon, and the biggest timber from Washington. Potatoes weighing from 4 to 11 pounds, and apples weighing from 1½ to 2 pounds, and strawberries from 10 to 12 inches around the waist, are common. O. R. Ballow, near Walla Walla, raised 6,000 bushels of apples to the acre last year, which at 50 cents per bushel would be $3,000 to the acre for a single crop. I could fill a volume with such facts.

"Here in your eastern timber-lands a yield of from 4,000 to 6,000 feet of first-class merchantable lumber to the acre is considered a good average. Oregon has 30,000 square miles of timber-lands that will yield from 30,000 to 450,000 feet to the acre. A fir tree was recently cut down that was 465 feet high and 220 feet to the first limb, and scaled 96,245 feet of lumber, or about as much as 20 acres of good average of eastern timber. Cedars grow from 150 to 250 feet high, and from 15 to 45 feet in circumference. Portland is constantly shipping to China and Japan solid timbers from 100 to 120 feet long, and from 20 to 26 inches square, and Oregon and Washington forests are the only possible sources of supply on all the globe. In the great international yacht race of 2 or 3 years ago the clouds of canvas on both Valkyrie and Defender were held to the breeze by masts of Oregon fir.

"Oregon's mineral riches include everything in human use but tin, and that has recently been found in small quantities. The Baker City region in the eastern part of the state last year produced about $4,000,000 in gold, and some of the richest discoveries in America mining history have been made within the past few months. The ore of the Great Northern mine, which was discovered in January by an ordinary German farmer named Guker, runs $200,000 to the ton—or nearly half pure gold. Guker picked out about $15,000 with the point of an old pocket-knife. The gold-bearing district covers 15,000 square miles, or as much as Massachusetts, Rhode Island, and Connecticut combined, and not one-hundredth part of it has ever yet been prospected.

"Portland, the metropolis of Oregon, is situated 110 miles from the mouth of the Columbia, or about 14 miles further from the ocean than Philadelphia. Its harbor is ample to accommodate the commerce of millions of people and is accessible to the largest ships that sail the seas. The city had in 1880 a population of 17,500. It now has, including its recently annexed suburbs, about 120,000, an increase of 600% in 18 years—at which rate it will have nearly 1,000,000 people in 1915. It ranks third among the cities of the world in its ratio of wealth to population. Its wholesale and jobbing trade last year aggregated nearly $150,000,000. It shipped one sixth of the total wheat exports of the United States. Its wheat and flour shipments for the three months of September, October, and November, 1897, amounted to $5,647,833, while those of Philadelphia for the entire year ending in June were but $3,508,375. One Portland flouring mill during the year shipped over $4,000,000 worth of flour to China and Japan, East Siberia, Europe, South Africa, Australia, Hawaii, Mexico, Central and South America. Portland's weekly bank clearings, the infallible test of business done, generally amount to more than those of all other Pacific coast cities north of San Francisco put together, including Seattle, Tacoma, Spokane, Vancouver, and Victoria. Its manufactures last year amounted to nearly $50,000,000, and included many of the staples of trade with Alaska, Mexico, Central and South America, and China and Japan. A large proportion of the Klondike supplies sold from San Francisco to Seattle and Port Townsend—woolens, blankets, clothing, boots and shoes, dried meats, fish and fruits, dessicated vegetables, and condensed soups and creams—are manufactured, put up, or originally handled, at Portland. The city has received a great impetus from the Klondike and Yukon rush, and is growing at a racehorse rate. Great country is the limitless Northwest."

COUNTIES OF WESTERN OREGON.

CLATSOP COUNTY.

By the Astoria Progressive Commercial Association.

Clatsop county contains about 700,000 acres, and lies in the extreme northwest corner of the state. About 550,000 acres are covered with the best fir (Oregon pine), spruce, cedar, larch, hemlock, maple, and alder timber that can be found in the world. One hundred and fifty thousand acres are prairie, cleared timber, reclaimed swamp, dyked and wild tide land.

In nearly the center of the county rises a prominent mountain, each end of which terminates in a lofty peak, known as "Saddle mountain." From this mountain and its immediate vicinity the water courses of Clatsop county radiate, emptying into either the Pacific ocean or the Columbia or Nehalem rivers. The largest of these are tributary to the Columbia, viz.: Young's river, with its Klatskanine branches, and Lewis and Clarke—the last named made historically famous by Lewis and Clarke, the explorers, who, with their party, wintered in 1804-5 on its west bank. The third river in size on the western slope of the Coast range is the Necanikum, which flows directly into the Pacific ocean at the southern end of Clatsop plains, about 20 miles south of the entrance of the Columbia. Other rivers, emptying into Young's bay or the Columbia, are navigable for small craft for several miles. They are, notably, the Walluski, Skipanon, John Day, Mary's river, and Bear creek. The Nehalem river, which forms a portion of the southern boundary of the county, rises in the great coal fields near the Willamette valley, and, after pursuing a serpentine course for 150 miles, empties into the ocean a fews miles south of Tillamook head.

Clatsop plains extend from the mouth of the Columbia to the mouth of the Necani kum, a distance of about 20 miles, with an average width of 2 miles. The soil of these plains is a sandy loam, producing grass, oats, and vegetables. It is conceded by experts that this soil is especially adapted for the raising of the "sugar beet." As many as 80 bushels to the acre of rutabagas for stock food have been grown on this soil. Between the plains and the foothills are peat marshes, upon which the wild cranberry is found in profusion, and when cultivated will yield a profitable crop of that delicious berry for the markets of the east. The river and creek bottoms and tide lands are composed of the richest soils and capable of raising cereals, vegetables, grasses, and hay. Not infrequently two crops of clover and timothy in one year have been grown and harvested on these lands, yielding fully 8 tons to the acre.

Hon. Wade Hampton Smith, of Fort Clatsop, furnishes the following concerning the geological formation of Clatsop county:

"The geological structure of the county is mainly of recent shales, soft sandstones, and indurated clays, belonging to the cretaceous and tertiary ages. The greater part of these formations seems to be an estuary deposit. This singular order extends north and south along the coast for many miles south of Astoria. Basaltic dikes protrude from the shales and indurated clays in many places. A central ridge, mostly basalt, 1,600 feet high, extends through the county from northeast to southwest. Saddle mountain, 3,500 feet high, is about the center of this ridge. It is of volcanic origin. The country rock is of a soft, friable nature. And the ice, during the great ice age, has carved the surface into ravines and gorges, making the numerous streams and valleys of Clatsop, and leaving numerous fertile hills and slopes and a diversified surface. The soil of the county consists mostly of the decomposed shales and indurated clays forming the subsoil, much of which is marlite, and very rich. The timber and vegetation that everywhere cover the surface often equal the jungles of the tropics. So dense is this, it is difficult to ascertain what minerals exist. Coal of excellent quality has been found, and there is every evidence that extensive deposits of good coal will be found in the older formations, under the more recent deposits. The evidences plainly point to a vast coal basin at no great depth underlying the entire county. Oil has been found oozing from the ground in several places; and oil and gas escape, in small quantities, from holes drilled to 100 feet in depth. Gas in considerable quantity has been found at a depth of 140 feet. The prospect of great coal oil and gas wells is good. There are also found in several places small deposits of brown hematite. Also first-class sandstone easy of access. Also good fire and brick clay."

The present population of Clatsop county is about 15,000, of which about 10,500 live in the city of Astoria.

Below are given statistics furnished by Hon. J. H. D. Gray, county judge of Clatsop county, for the year 1897. While the totals given are in round numbers, they are approximately correct, and will give a very good idea of the present status of the county as a producing region for cereals, grasses, vegetables, stock, fish, etc.:

Acres under cultivation	9,650
Wheat, bushels	3,500
Oats, bushels	11,000
Barley and rye, bushels	200
Hay, tons	9,000
Corn, bushels	400
Butter and cheese, pounds	149,000

Salmon, barrels	500
Salmon, kits	800
Hops, pounds	43,500
Potatoes, bushels	54,000
Apples, bushels	4,600
Prunes and plums	800
Salmon, cases	407,944
Clams, boxes	5,000
Clams, cases	4,000
Rutabaga turnips, tons	170
Carrots, tons	100
Lumber, feet	28,000,000
Wool, pounds	4,000
Sheep, head	700
Hogs, head	500
Horses, head	800
Mules, head	50
Cattle, head	4,000
Honey, pounds	20,000

The climate of Clatsop county is healthful, no epidemic or prevalent diseases being known. It is mild and the thermometer seldom falls below 20° above zero. During some winters there is no ice at all, and no snow of any consequence.

We give below a statement upon the subject of the climate and health matters of Clatop county from Dr. J. A. Fulton, health officer for the state of Oregon for the port of Astoria. He says:

"The air coming off the Pacific ocean being at or near the same temperature throughout the year, controls the temperature of the atmosphere in this locality, so that in the winter severe cold weather is unknown and in the summer very hot weather is never xperienced. The average temperature, as shown at the U. S. signal service station at Astoria in 1896, an ordinary year, was as follows: For the six colder months, from Octoer 1st to March 31st, 40·85°; the six warmer months, from April 1st to September 30th, 1·01°. This report, which is absolutely reliable, proves Clatsop county to be the most greeable climate, with the least variation of temperature either way, to be found in the emperate zone. What influence does such a climate have upon the health of its inhabants, is a question which naturally arises. After an experience of fifteen years in the ospital in Astoria, which enables me to speak from knowledge, it can be truthfully said hat there is no disease common to this locality, but there are diseases common to other limates which are rarely, if ever, met with here. Clatsop county is, and always has been, bsolutely free from all forms of malarial diseases, and persons who have become saturated with the poison of malaria from a residence in a malarial district rapidly recover after a hort residence in this locality. All those bowel diseases common to hot summer weather are practically absent here, and the mortality among infants is no greater here in the ummer than it is at other times of the year. Sunstrokes and frost bites are never experienced, and there is less of pneumonia here than in climates with a more variable temperature. While there is more or less catarrhal disease here, still, that form of catarrh contracted in a dry atmosphere full of dust is almost invariably benefited by a residence here. Typhoid fever and other afflictions which arise from infection or contagion are, owing to the pure air and even temperature of this climate, not ordinarily as severe or so difficult to control as are met with in other climates. Those having a predisposition to tubercular disease of the lungs, *i. e.*, consumption, do badly here owing to the moist air and low altitude. The mortality of Clatsop county for the year 1896, an ordinary year, was less than 12 for every 1,000 of its inhabitants; that of the state of New York was 17, and that of the city of London (one of the healthiest cities of the world) is 15, showing conclusively that the climate of this region is highly favorable to health and longevity. The uniformly pure air, the even range of temperature, the pleasant breezes from the salt water of the ocean, cause a feeling of relief and comfort to all coming from other climes into this; and a short residence here has brought rest and sleep and appetite to many a worn out business man and nervous patient.

"Taking everything into consideration, both for and against, there can be but one verdict and that is, for health and cemfort there is no other country known with a climate equal to that of Clatsop county, Oregon."

The principal seaside resorts of Clatsop county are Gearhart Park, Seaside, Clatsop, and Cannon beaches, where thousands come every year to enjoy the delightful sea breezes, surf bathing, trout fishing, and near by mountain rambles.

Astoria, the county seat of Clatsop, was founded by John Jacob Astor, and made the principal station for the Northwest Fur Company, of which he was the principal owner, in 1810. It was the first American settlement on the Pacific coast, and its early history is weird and interesting, as those who have read Washington Irving's "Astoria," and the record of the Lewis and Clarke expedition early in the present century, can attest.

Astoria is situated on the north side of a peninsula, which is about 1¼ miles in width and 2½ long, extending from the mainland down to the junction of Young's bay and the Columbia river. Running parallel with the city proper is a water frontage extending a distance of 5 miles (this frontage will be extended and an additional 5 miles will be added when Flavel, New Astoria, and Warrenton are bristling with wharves and warehouses), where deep-water vessels of any size in the known world can lie at the various wharves or anchor in the stream. Here is the customs port for the district of Oregon. The government has erected a substantial stone structure for the use of the customs and postoffice officials, as also a large brick structure for a bonded warehouse.

Five or six lines of steamers owned in Astoria ply daily to ports, rivers, and bays in the vicinity. Three daily lines of steamers connect Astoria with Portland, and ocean steamers to San Francisco, Alaska, China, and Japan go out several times each month at stated intervals. From one to a dozen of deep-water sailing vessels and coasting steamers can be seen any day at the wharves, or anchored along the water front.

Astoria is a large distributing point for passengers and freight for Shoalwater bay, Gray's Harbor, and other points in Western Washington.

The great industry of Astoria is its salmon fishing, which in season employs several thousand men and women in catching, canning, labeling, and shipping to the marts of the world. It is the largest salmon fishing point on the globe.

Among Astoria's industrial institutions, one of the most substantial is the Astoria Iron Works. Its product of machinery, mostly invented here and used in the canneries of the coast, amounts to about $75,000 per year. During the past year this institution has added to its plant shipways, at a cost of $10,000, and these have already disbursed in the neighborhood of $40,000 in the repair of tugs and ocean steamers.

The Pacific can factory is another of Astoria's steady workshops, employing an average of 125 persons in the manufacture of salmon, fruit, and other cans, that are required in the Northwest. Their pay roll is about $60,000, and the product about $450,000 per annum.

Astoria has a number of smaller manufacturing institutions, the product of which is from $10,000 to $30,000 each year, with an aggregate product of about $200,000 per year, and a pay roll of about $60,000.

The electric light system of Astoria and electric car lines (two separate companies) disburse about $70,000 annually.

Astoria's water system, completed in 1896 at a cost of $260,000, has proved very successful. The capacity is 5,000,000 gallons daily. The water comes 12 miles, by gravity, from a mountain stream and a lake having an elevation of 600 feet, and flows into a 6,000,000 gallon reservoir, located 285 feet above the water front. From the reservoir the water is distributed by iron mains to every section of the city. Fire hydrants have been put up on every street corner in the principal part of the city. As a result of this improvement in the fire protection, insurance rates have been materially reduced. Astoria has a water supply sufficient for five times her present population.

The completion of the government jetty at Point Adams, extending 5 miles into the ocean has practically annihilated the once "dreaded" Columbia river bar, and now, instead of two torturous channels across it, one straight channel, 35 feet at mean tide, three-fourths of a mile in width, lets ocean steamers in or out at any hour of the day or night; and with a leading wind sailing vessels can cross without the aid of a tug or bar pilot with perfect safety.

The completion of the Astoria and Columbia River railroad places Astoria in direct rail communication with every place of importance in the United States and the Canadas, and in the closing link that places London, Liverpool, and New York on the shortest line between continental Europe and the Atlantic seaboard with China, Japan, and the fruitful islands of the East Indies.

For the investment of capital for saw mills, flour mills, shingle mills, manilla, hemp, twine and cotton rope and cord factories, furniture, sash and door, tub and bucket factories; and for the manufacture of goods wanted in the market of the Orient, Astoria is the best point on the Pacific coast. It is only 10 miles from the ocean and will be the place "ocean meets rail" for the transshipment of produce and manufactured goods from transcontinental American railroads, and the wares and produce of the Orient from trans-Pacific liners.

Thomas H. Benton did not live long enough to see his prediction fulfilled, but there are many living today who will realize what he clearly foresaw in his letter to the people of Oregon, through Mr. John Shivley, written in Washington in March, 1847. The letter concludes as follows:

"In conclusion, I have to assure you, that the same spirit which has made me the friend of Oregon for thirty years—which led me to denounce the joint occupation treaty the day it was made, and to oppose its renewal in 1828, and to labor for its abrogation until it was terminated—the same spirit which led me to reveal the grand destiny of Oregon in articles written in 1818, and to support every measure for her benefit since—the same spirit still animates me and will continue to do so while I live—which I hope will be long enough to see an emporium of Asiatic commerce at the mouth of your river, and a stream of Asiatic trade pouring into the valley of the Mississippi through the channel of the Oregon."

COLUMBIA COUNTY.

By Hon. Judson Weed, of St. Helens.

In presenting to the public the advantages, resources, and possibilities of Columbia county, it is not the desire to detract from any other county in the great state of Oregon. The surrounding conditions of a town, county, or state have much to do in determining the location of a home or the investment of capital, and while Columbia is the peer of every county in Oregon, and Oregon the peer of every Pacific state, yet Washington, the Dakotas, Idaho, Montana, and California are capable of supporting millions of population, and offer inducements to thousands of honest toilers of the east to "go west" and establish comfortable homes, and to the capitalist to invest in profitable business; so, also, the adjoining counties, Multnomah, Washington, and Clatsop, and Cowlitz and Clarke, of Washington, offer inducements similar to those offered by Columbia county. Columbia is not an Eden, pent up and hedged in by insurmountable barriers, but is surrounded by competing industries and congenial neighbors. It is located in Northwestern Oregon, west of the Coast range, 30 miles inland from the Pacific ocean, on the great Columbia river, on which it has more than 50 miles frontage. The Columbia river, which forms its entire northern, and most of its eastern boundary, is here more than 1¼ miles wide, and deep enough to admit the largest ocean steamers; and its banks are sufficiently high to prevent inundations. The tides, which rise about three feet here in the river, affect the water as far as Portland, which is 30 miles above St. Helens, the county seat of Columbia county. Thus, while almost one half of the entire boundary of the county is only a few feet above the ocean level, and as there are no mountain peaks in the county, the average altitude of the whole surface is but a few hundred feet above the ocean.

The area of the county is 433,740 acres, of which 98⅓% is already appropriated, being a larger per cent. of appropriated lands than is found in any other county in the state, the percentage of appropriated lands in the state being a little less than 82½%.

The drainage of the county is perfect. The northern and eastern parts are drained into the Columbia river, through the Clatskanie, Beaver, Goble, Tide, Milton, and Scappoose creeks, most of which are large enough to admit boats for some miles inland, and all of which are used for floating logs and lumber to tide water.

The southern portion is drained by the Nehalem river and its tributaries, the principal of which are Clear creek, Beaver creek, Rock creek, Pebble creek, East Fork, Deer creek, Fish Hawk, and Deep creek.

When it is understood that these are all living streams of pure, clear water, without a stagnant pool, fed and kept up by never-failing springs, it will be seen at once that a better watered region does not exist.

CLIMATE.

There are physical conditions which make this one of the most delightful climates on the globe. Its altitude is below the snow belt of the Coast range, and its near proximity to the coast brings it within the influence of the great Japan current, which modifies the temperature so that in winter there is but little snow and rarely any ice. As an evidence of the mildness of the winters, the writer (who is a native of Southern Ohio and is spending his first winter here) has observed that up to this date, March 10, 1898, the rose bushes and many other shrubs on the lawns in the vicinity of St. Helens have retained their foliage as fresh and green as in summer, while full-blown roses were picked from the bushes on Christmas day and half-open buds remained in fine condition until the last of February. The heat of summer is modified by the snow-capped peaks of Mt. Hood, Mt. Rainier, Mt. St. Helens, and others. Wind above a gentle breeze, or lightning is of rare occurrence here.

The soil is generally clay loam, mixed in parts with some sand, with a subsoil of dark clay, admirably adapted to the storage of large quantities of the winter's moisture for the use of growing plants through the dry summer. And, though there is but little rainfall from June to November, vegetation never becomes dry nor withers. The soil seems adapted to the growth of all sorts of vegetables, grasses, grains, fruits, shrubs, and trees. That the soil is fertile, a few examples of yield (and that without fertilizers of any sort) will suffice to convince any one. Four tons, and not infrequently six tons, of good, timothy hay to the acre is the usual yield; 40 to 60 bushels of wheat of good quality; 80 bushels oats, and from 400 to 800 bushels potatoes. Cabbages weighing 40 pounds per head are not uncommon. Turnips, rutabagas, carrots, parsnips, and beets and onions do equally as well. If other evidence of fertility and productiveness is wanted, it may be found in the growth of the timber. To those who have never seen nor traversed the forests of fir, spruce, hemlock, and cedar of Columbia county it is simply incomprehensible. He, to comprehend it, must see trees 6 to 12 feet in diameter and 250 to 300 feet to the first limbs, and standing so thickly on the ground that when they are felled by the settler for the purpose of clearing the ground for cultivation they often lie 12 to 15 feet deep on top of the ground. Many quarter sections produce as much as 7,000,000 of feet of sawed lumber. Instances of 60,000 shingles from a single tree are not uncommon. We do not pretend to say that the timber is so heavy in all parts of the county. Many farms have been cleared up, and many millions of feet of lumber and cords of wood have been marketed, while many acres have been ruthlessly denuded by careless or criminal negligence in kindling fires. Yet there are thousands of acres of the best of timber available.

As to the varieties and sorts of growth one may find here, the writer will name what he saw in a trip from St. Helens to the western border of the county, and as he is not a botanist he will give the common, local names as he learned them. Most conspicuous are the red, white, and yellow firs, red and white cedar, with some spruce and hemlock. The deciduous sorts are ash, maple, alder, oak, and dogwood, with an undergrowth of vine maple, hazel, wild cherry, Oregon grape (which is not a grape but a berry which grows on a shrub), salal, huckleberry, raspberry, blackberry, gooseberry, currants, barberry, crab apple, elk berry, devil's walking stick, and ferns, with many others not named. Many of the deciduous sorts attain a considerable size, especially the alders and maples, which frequently measure 30 to 36 inches in diameter, the hazel also grows to several inches in diameter and 15 to 25 feet high. I mention this fact for the benefit of my eastern friends who never saw an alder nor a hazel larger than a pedagogue's school room moderator.

The principal industries of the county are the manufacture of lumber and shingles, logging, dairying, fishing, horticulture, and agriculture. There are a number of saw mills and shingle mills with a capacity of from 15,000 to 50,000 feet per day, and which give employment to a large number of hands and teams. The conditions for logging and putting wood on the docks are the most favorable that could be desired. The many streams having their origin in the watershed between the Nehalem and Columbia rivers and emptying into the latter afford natural passage ways to the river. The logs are cut in the forest, from which they are conveyed by teams and engines to the creeks, where they are dumped in, when the dams are opened and they are floated to the river where they are constructed into rafts and towed by tugs to the markets. The wood is conveyed to the docks through flumes built for that purpose. Some 3 or 4 flumes are already in operation. One flume, which is built from the dock at St. Helens, extending up Milton creek some 2 or 3 miles, is capable of discharging 500 cords per day at a cost of 5 cents per cord. There are sash and door factories situated at Rainier on the Columbia, and at Pittsburg on the Nehalem.

The abundance of grass and the cheapness with which other foods may be produced make dairying a profitable industry. Several dairies and creameries are located in the county, while quantities of milk are shipped to Portland and Astoria.

Fishing is an industry of great importance. The great extent of river front, and the many streams flowing therein, afford large facilities for carrying on the business. During the fishing season the waters are crowded with the finest of salmon. Columbia river salmon are noted the world over for their fine quality and delicate flavor. Much capital is invested, and many hands employed, in the business.

Agriculture is carried on in all parts of the county, but more particularly along the Columbia and Nehalem rivers, although some fine ranches are being opened on the divide between those rivers. As already noted, the soil is productive and adapted to the growth of large crops of almost every thing the farmer may wish for his own consumption or for supplying the markets of the cities and villages of the surrounding country. The writer has taken personal observation of the agricultural and horticultural interests of 18 or 20 different states, east, south, middle west, and west, and in no locality has he found the farmer able to produce so abundantly, not only the necessities but the luxuries of a farmer's life at so small an outlay of labor or money. In order to have the finest of hay or pasture the settler has only to make a "slashing" in the timber during winter, then in summer set fire to it, and when it has burned off sow grass or clover and the thing is done. We have seen farms where not more than 25 or 30 acres were in cultivation on which were cut 100 tons of cured hay, besides furnishing all the grain, fruit, and vegetables the farmer needed for his large family. But little grain is required for stock, hay being the principal feed for work cattle and horses, while stock cattle and sheep live principally on the range and are usually fit for beef or mutton at any time. The farmer finds a ready market at remunerative prices for every thing he grows. Owing to conditions already referred to, this is not a corn growing section; but little is planted except for roasting-ears and canning. It grows large, but will not fully mature, the stocks sometimes remaining green until Christmas.

Horticulture is in but an embryo state, but enough has developed to show that its possibilities are not surpassed in any section of the globe. Wherever trees are planted, apples, pears, prunes, plumes, cherries, and quinces are all that can be desired in early bearing, color, quantity, and size, or in hanging on and keeping qualities. Small fruits of all sorts do extremely well.

TOWNS.

St. Helens, the county seat, is situated on the Columbia river 30 miles below Portland, and about 70 miles above Astoria. It has an extensive dock and a fine landing, where the largest boats may land with safety. The court house, county offices, and other public buildings are located here. It has a public school, three churches, two hotels, and a number of other business houses. It has four daily mails, two by river and two by rail. It is surrounded by a fine farming, gardening, and dairying country. Easy of access from all parts of the county, with natural advantages, it is destined to become an important point.

Rainier, situated about midway of the river boundary of the county, is a thriving little town. It has a good school, church, sawmills, sash factory, and several business houses; also a creamery.

Clatskanie, at the head of steamboat navigation on the Clatskanie river, is a thriving village.

Goble, situated at the crossing of the Columbia river by the Northern Pacific railroad and Columbia City, a few miles below St. Helens, are villages of some note. Goble has a cold storage warehouse.

Houlton, one mile west of St. Helens on the Northern Pacific railroad; Warren, six miles above, and Scappoose, on Scappoose bay, are thriving towns with a bright future.

Mist, Pittsburg, and Vernonia on the Nehalem river, are thriving towns in a rich timber belt. On Pebble creek, not far from Vernonia and Pittsburg, are heavy deposits of bituminous coal, 6 to 8 feet in thickness where worked. On Rock creek, which enters the Nehalem at Vernonia, are deposits of gold and silver. Rich deposits of iron are found in different parts of the county. There are some 56 schools in the county which are continued from 5 to 10 months in the year.

There are 30 postoffices in the county, most of them receiving daily mail, while several receive mail twice, and some four times daily. There are several good church buildings in the county, while at most of the school houses Sunday schools and church organizations are kept up. The ministry and the schools compare favorably, in talent and advancement. with the most favorably situated in the East. Two sections of land in each township are set aside, the sale of which forms an irreducible school fund loaned by the state government for the benefit of public schools.

The facilities enjoyed by the people of Columbia county for travel and commerce is no mean item in the many inducements held out by the county to persons desiring a western home with eastern advantages and luxuries. The great Columbia river with its many river and ocean vessels is paralleled from its mouth to almost its source by the great Southern Pacific, Northern Pacific, and Astoria and Columbia River railroads, the competition of which makes it possible to reach points on the river for less than 1 cent per mile. As soon as the road is completed from the Columbia to the Nehalem, and the Nehalem is opened up for the floating of logs and lumber to its mouth, the development and growth of the county will be unparalleled. For its rich soil, luxurious growth of timber, and immense deposits of coal, iron, and other minerals, the ease and facilities with which crops are produced, the immense and as yet unused water power distributed all over the county, the mildness of the climate, the healthfulness of the country and the great facilities for sending the products to all the markets of the world, make it one of the most favored counties west of the Mississippi river. The timber is said to be of the best in the world for shipbuilding and piling The purity of the water and absence of sudden and extreme changes in temperature, coupled with a healthy growth of all animal and vegetable foods, make it next to impossible to get sick, provided one adheres to the common sanitary rules of life.

It has been stated elsewhere that more than 98% of the government lands in the county have been appropriated, a larger per cent. than in any other county of the state, which shows the desirability of Columbia county lands; and, although there is less than 2% subject to entry, yet the opportunity for obtaining cheap homes is equal to any region in the west. The railroad companies own thousands of acres of the finest farming, timber and mineral lands, while other thousands are owned by capitalists. Yet it is all in market and can be had at very reasonable prices and on easy terms.

Another important feature, and one in which every property owner is interested, is the assessment roll and tax duplicate of the county. While county officials as well as all others are desirous of making all necessary improvements in the way of good roads, etc., and are willing to pay fair prices for fair service, yet they guard against burdensome taxation, and, while the rate, 27 mills, might seem high to some, an examination of the assessor's roll will show it to be comparatively low. Real estate is put on the roll at about one-fourth its real value, and chattles at about one-third to one-half, with an exemption of $300, Thus it will be seen that the rate is scarcely 9 mills, and the railroads and telegraph lines, of which there are over 40 miles; pay a large per cent. of the taxes of the county.

While there is comparatively little rocky surface in the county, there is an abundance of the best building stone in the quarries, and the basalt rock is the best in the world for macadamized roads, lasting longer than limestone or gravel.

There are a few mineral springs in the county which seem to possess rare medicinal properties.

And now our task is finished. We have tried to present to you the physical features and natural resources of Columbia county, and from their study let you deduce what labor and capital judiciously applied would develop. Some of our statements may seem, to the far-Easterner who has never seen the Pacific coast, to be overdrawn, but there is not a single one that cannot be verified on the spot. Remember that the western half of the continent contains the most extensive plains, the highest mountains, the densest forests, broadest rivers, and largest trees of North America, and the people try to emulate nature in the size of their farms and the quantities of their products. Not for the world would we create the belief that one may come here and amass a sudden fortune and live in ease and luxury without care or toil. There are forests to clear and roads to build. Skies are not always clear. One must expect to encounter rains in winter. But we believe there is room for thousands of honest toilers among the mills and mines and wornout and sterile hills of the east to better their conditions in life, and leave to their children a legacy better than a precarious living obtained by constant toil amid the uncertainties of an overcrowded business and failing energies of an exhausted soil. And we believe there are thousands who would avail themselves of the opportunity of such a change if they but knew where to find it.

MULTNOMAH COUNTY.

By Ellis G. Hughes, Portland.

Multnomah county is bounded on the north by the Columbia river and Columbia county, on the east by the Cascade mountains, on the south by Clackamas, and on the west by Washington county. The county is a strip of land lying along the south bank of the Columbia river, is about 50 miles in length, and from 6 to 12 miles in width. Its eastern third lies in the Cascade mountains and is, with the exception of some few small valleys, not subject to cultivation. The balance of the county is made up of bottom land along the rivers, on which are some of the finest dairy farms in the Pacific Northwest, and level and hill land, all subject to cultivation, and adapted to general farming, but which is almost exclusively devoted to market gardening and fruit culture, which is rendered more than usually profitable in this county, by reason of the ready market afforded such products by the city of Portland, to which the county owes its position as the most densely populated county on the Pacific coast, outside of that in which the city of San Francisco is situated.

The city of Portland is situated on both sides of the Willamette river, a few miles above the confluence of that river with the Columbia, and at the extreme head of navigation for deep-sea vessels of all classes, of both rivers, and is at this time not alone the principal seaport, metropolis, trade, and financial center of the Pacific Northwest (which includes the states of Oregon, Washington, and Idaho), but is the greatest railroad center west of the Rocky mountains, far surpassing in the number and mileage of its roads the city of San Francisco, which alone, of all the cities of the Pacific coast, exceeds it in population, or can hope to rival it in the magitude of its shipping, commercial, financial, and general business interests.

The city has at this time (1898) a population of between 90,000 and 100,000. In the character of its public and business buildings, residences, and general improvements, the city ranks as first among the cities of its size. Its city hall, postoffice, public library, and school buildings would grace a city of five times its population, and the government is just beginning the erection of a custom house, to cost $1,000,000. Among its business buildings are several that would grace any city, notably the Hotel Portland, the Marquam building, the Oregonian building, the Chamber of Commerce, the Dekum, the Worcester, and the Meier & Frank buildings. It has well improved streets, a complete sewer system, more electric street railway in proportion to its size than any other city in the United States, save Denver, and a water supply which it would be impossible to surpass in purity, and ample in quantity for a city of over 1,000,000 population. The water is the purest mountain spring water, is brought a distance of 35 miles from the heart of the Cascade mountains, and, as the government has granted the city a reserve of the entire water shed of the stream from which it is taken, it can never be fouled or rendered less pure than it now is. The present system delivers to the city by gravity 24,000,000 gallons daily, while the stream from which it is taken is large enough to increase this supply many times, by the construction of additional pipe lines.

The position which Portland occupies at this time as principal port of export and import, and metropolis, financial and trade center for the entire Pacific Northwest, is one which she has enjoyed uninterruptedly since the first settlement of the country, and as it is the result of natural advantages as a seaport, and its relation to the great trade of export and import, as also of its position in relation to the great producing sections of the country, it is safe to assume that it will continue to occupy its present position, until some means of transportation shall be invented which disregards grades and annihilates distances.

For some years Portland was at some disadvantage as a seaport, by reason of the depth of water on the Columbia river bar, and the changes of the channel there. But in the year 1895 the government completed a jetty, designed not only to deepen the channel over the bar, but also to render its location permanent. The results of the work have been better and more immediate than was anticipated, and at this time, only three years after the completion of the work, there is a channel having, for a width of over one-half mile, a depth of 31 feet at extreme low water, and this depth is being increased at the rate of from 1 to 2 feet per year, by the action of the tides and the current of the river, and it is not unreasonable to expect that it will attain a permanent depth considerably greater than it now has.

Between Portland and the mouth of the Columbia the ship channel has at this time a permanent depth of 23 feet at extreme low water at the shallowest point, with a tide of over 4 feet. But as a rule the channel is of even greater depth than 35 feet, and the shallow places where the depth is less than this are but few and the bars short. Much has already been done by both the government and the Port of Portland, in the way of permanent improvement of the channel, and the few obstructions not removed in this way it is intended to remove during the present year by dredging. For the purpose of making and permanently maintaining a channel of 30 feet from Portland to the sea, the Port of Portland will place at work, during the present season, one of the most powerful suction dredges, of the Bowers pattern, in the United States, and it is anticipated that there will be no difficulty in making a channel of 25 to 30 feet throughout the entire distance before the close of the present season, and of permanently maintaining the same at but little expense.

The importance of Portland as a seaport is best shown by her present shipping interests, which exceed those of any other port on the Pacific coast, excepting San Francisco, and are growing at a rate which bids fair to place Portland in the lead of that port in a very few years. Of permanent and regular steamer lines, there are a line to China and Japan, the business of which has grown to such proportions as to require the addition of several regular steamers thereto during the present season, while to relieve the accumulation of freight that the regular liners were unable to carry it was found necessary to charter five additional steamers for April and May sailings during the present spring (1898); a line to San Francisco, and three lines to Alaska, all overcrowded with business, besides several small coasting lines, and a regular clipper ship line between Portland and New York; while its general commerce, by way of sailing vessels and irregular steamers, is very heavy, and employs between 100 and 200 vessels each year. The size of the vessels which visit this port regularly from all parts of the world is perhaps best shown by its wheat fleet. Of vessels carrying wheat and flour exclusively, in the four months from September 1 to December 31, 1897, 69 vessels, sail and steam, cleared from this port for European, African, and Australian ports, the smallest of which, a sailing vessel, carried 1,230 long tons, and the largest of which, a steamer, carried 5,312 long tons of wheat and flour, while the 20 largest of the 69 vessels averaged each a cargo of wheat and flour of 3,865 long tons, the smallest carrying 3,260 long tons, and the largest 5,312 long tons. The largest cargo of lumber ever loaded in the world was placed aboard the steamer Glenlochy, in the Portland harbor, in the month of October, 1897, the cargo being 3,077,085 feet, and having been shipped by the Pacific Export Lumber Company, of Portland, to Vladivostock, Siberia.

In its relation to the great producing sections of the Pacific Northwest, agricultural, mineral, and timber, the position of Portland is simply impregnable. The great section which embraces the three states of Oregon, Washington, and Idaho is not a prairie country. It is a country of valleys, some of which equal in size considerable eastern states, of great rivers, and rugged mountain ranges, and transportation lines, while if not impossible in almost any direction, are only possible, on the basis of profitable construction and operation, by following the lay of the country.

The great agricultural districts of the Pacific Northwest are: Southeastern Washington, the southern portion of Northern Idaho, Central Idaho, the northern portion of Eastern Oregon, Western Oregon, and the southern portion of Western Washington, all in part developed, and the southern portion of Eastern Oregon (a section about the size of the state of Iowa) at present without transportation lines and undeveloped.

So far as discovered and in part developed at this time, the gold and silver mining districts are the Cœur d'Alene, in the southern portion of Northern Idaho, the Central and Southern Idaho districts, the Blue mountains or Baker county mining district of Eastern Oregon, and the Southern Oregon district in Jackson and Josephine counties in this state. The great timber belt lies west of the Cascade mountains, and stretches from the southern boundary of Oregon to the northern boundary of Washington.

Of these agricultural and mining districts, the nearest, in point of distance, to any of the ports on Puget Sound are those situate in Northern Idaho, Southeastern Washington, and the northeastern corner of Oregon. But from all these sections the distance is much shorter to Portland than to any point on Puget Sound. This is best shown by taking the distance from central points in each district. Garfield, in the Palouse district, and Walla Walla in the Walla Walla district, both in Southeastern Washington, Pendleton in Northeastern Oregon, and Wardner, in the center of the Cœur d'Alene mining district, are all not alone such central points, but are points which are most favorable to Puget Sound ports in a comparison with Portland, as to distance. Taking the distances as given by the respective railroads in their own folders and time cards, and comparing Tacoma and Seattle (the two principal cities on Puget Sound, as also the two most favorably located) with Portland, the result will be found to be as follows:

	Miles.
Garfield to Tacoma	429
Garfield to Seattle	449
Garfield to Portland	379
Walla Walla to Tacoma	322
Walla Walla to Seattle	342
Walla Walla to Portland	245
Pendleton to Tacoma	309
Pendleton to Seattle	329
Pendleton to Portland	231
Wardner to Tacoma (by transshipment on Lake Cœur d'Alene)	501
Wardner to Seattle (by transshipment on Lake Cœur d'Alene)	521
Wardner to Tacoma (all rail)	802
Wardner to Seattle (all rail)	822
Wardner to Portland (all rail)	469

For all Central and Southern Idaho, the difference in distance is practically the sam as from Pendleton. From all of Eastern Oregon, except the northeast corner, and for Western Oregon, the shortest route to any point on Puget Sound, is through Portland.

But there is not alone this difference in distance in favor of Portland, as from Eastern Oregon and Washington, and from Idaho points, the difference in grade is of even more importance than the difference in distance. None of this country can reach the seaboard, or a general market for its products, without crossing the Cascade mountains. By means of a long and expensive tunnel, the Northern Pacific, which offers to Puget Sound the most favorable connection which it has with this country, has managed to cross these mountains at an elevation of 3,800 feet. But the road to Portland, following the Columbia river, passes through these mountains, not alone on a water level, but on a slightly descending grade, and the same power which will take 15 loaded cars over these mountains to Tacoma or Seattle, will take 50 such cars through them to Portland, a difference which, taken in connection with the from 12% to 25% difference in distance, gives Portland an advantage of considerably more than 100% in competing for the business of all this section. It is this advantage which has placed her in control of the export of its products, and made her the center of distribution of such articles as it consumes.

Outside of those enumerated above, there are no agricultural districts of any considerable extent in the Pacific Northwest. In Eastern Washington there are, on the Northern Pacific, the small valleys of the Kittitas and Yakima, and on the Great Northern, the still undeveloped Great Bend section, which though all nearer Portland by grade, are nearer to Puget Sound in distance, and, with the country immediately surrounding the Sound, may, in the end, become tributary to Seattle or Tacoma to the exclusion of Portland. The balance of the three states of Oregon, Washington, and Idaho, belongs by the laws of distance and grade to Portland.

As a railroad center, Portland is without a rival west of the Rocky mountains. On the north the cities of Puget Sound have connection with the Great Northern and Northern Pacific lines; on the south the city of San Francisco has the Southern Pacific; but Portland has all these, and in addition the Union Pacific, as also a direct through car connection with Rock Island, the Burlington and other roads centering at Denver, through the Denver, Rio Grande and Western, and Oregon Short Line.

Of these lines, the Northern Pacific owns its own line to Portland, and, though Tacoma on Puget Sound is its nominal western terminus, all of its through trains are operated direct to and from Portland, as the point of starting and final destination, with a stop each way of only 15 minutes at Tacoma—and Portland is the actual terminus. The Great Northern operates through trains to Portland, by way of the Oregon Railway and Navigation Company's railroad, with which it makes connection at Spokane in Washington. The Union Pacific and the Denver lines make through connection and operate through trains to Portland by way of the Oregon Short Line and Oregon Railway and Navigation railroads, while the Southern Pacific operates its own road to Portland by way of Western Oregon, giving a through connection with California and the southwest, and also giving a through eastern connection by way of the old Central Pacific from Sacramento. In addition to the above through lines, Portland has several local lines extending into its tributary country, notably two lines extending into the Willamette valley, and giving connection with both sides of the river, and a road to Astoria now about completed, while the Oregon Railway and Navigation Company road, by means of a complete system of branches, affords local connection with all the developed section of the Pacific Northwest lying east of the Cascade mountains, and the Southern and Northern systems, with their branches, give a very complete local connection with all Western Oregon and Washington.

While no man can predict the future with certainty, and a descriptive article of this kind should be, as a rule, confined to the present, still there are some elements in the situation of Portland which render its relations to future railroad building in the Pacific Northwest something more than a guess, and make the probable, or rather the certain, results of coming years worthy of very careful consideration.

North of the Columbia river the only passes over the Cascade mountains, practicable for railroad building, and which lead to Puget Sound or its connecting waters, are now occupied by the Northern Pacific, the Great Northern and the Canadian Pacific railroads. Still south of the pass occupied by the Northern Pacific there is a pass, but its western slope is to the Columbia river, to which the stream which is followed leads, and any railroad constructed through that pass will naturally come to Portland. South of the Columbia river there are two practicable passes, one by the Santiam river, and one by the Middle Fork of the Willamette river. Both of these will, in all probability, be occupied by roads leading into Eastern Oregon, and these roads will naturally lead to Portland. In addition to these, there is the route by the north bank of the Columbia river still unoccupied, which also leads to Portland.

Some steps have already been taken looking to the occupation of two of these passes. There is a road already constructed for 14 miles east of Vancouver, in Washington, which is to offer Portland a direct and short connection with the Yakima valley, and other parts of Eastern Washington, and will occupy the pass north of the Columbia and south of the Northern Pacific. That part of the line now in existence was constructed prior to the financial crisis of 1893. Active work has been resumed, and it is claimed that it is soon to be completed. Some years since a road was finished from the Willamette valley, through the western portion of the Santiam pass, and to about the top of the Cascade mountains. With the coming of dull times the company became bankrupt, and the road passed into the hands of a receiver. Within a short time this road has passed into other hands, and preparations are now making to extend it into Eastern Oregon. The completion of this road will develop and place in connection with Portland a section of country fully as extensive as that at this time occupied by the Oregon Railway & Navigation Company, and will not only contribute very largely to the general prosperity of the country, but will extend the field of Portland's commerce by at least two thirds, if it does not double it, within a very few years.

But Portland is not alone the second in size and volume of business, of the seaports of the Pacific coast, and the greatest railroad center west of the Rocky mountains, she is the center of the only river lines of transportation existing in the Pacific Northwest, or to any considerable extent on the Pacific coast.

The Columbia river, with its tributary, the Snake, is navigable, with one short portage, as far up as Lewiston, in Idaho; its tributary, the Willamette, as far up as near the head of the valley of the same name. These rivers penetrate the best of the agricultural districts, and, with several smaller rivers in Western Oregon and Washington, afford facilities for the operation of a considerable number of steamboats, which not alone regulate, to a very considerable extent, the charges of the railroads, but which themselves carry on a very large traffic. At the present time this embraces routes on the Columbia, Willamette, Lewis, Cowlitz, Clatskanine, and Yamhill rivers, making a very complete system of river transportation, reaching both Eastern and Western Oregon and Washington, and all centering at Portland.

These natural advantages have made of Portland a very considerable trade center, and though it cannot pretend to such a trade or commerce as that of some of the larger seaports and trade centers of the East, in proportion to the population and state of development of its tributary country it is the equal, if not the superior, of the best of them, while on the Pacific coast it has but one rival, the city of San Francisco, a present rival which it is fast outstripping in the race.

Accurate statistics of the trade of Portland are not at hand, but the most conservative estimates place its wholesale and jobbing trade as at this time about $70,000,000 annually. Prior to the crisis of 1893 it was considerably larger than this, but Portland has felt the depression of the last five years in common with the rest of the United States, and is only just beginning to work back to her old volume of trade.

While Portland cannot lay claims to any very prominent position as a manufacturing center, still her interests in this line are by no means small, and here, as in all else, she leads all other cities in the Pacific Northwest. The lines in which Portland manufactures, to a greater or less extent, are too numerous to permit of their being given in detail, but there are very few principal branches which are not represented. Lumber and its products, and flour and its products, play a leading part, and the output of the manufactured product in each of these lines will exceed $2,000,000 annually. But a large business is also done in cordage, furniture, iron work, packing, ready-made clothing, and numerous other lines, and the total output will exceed $20,000,000 annually.

As a manufacturing center, Portland offers one advantage possessed by but very few locations in the United States. Thirteen miles south of Portland the Willamette river makes a fall of 42 feet. This fall, according to the measurement of the United States engineers, affords a water power running from 72,000 horse power at extreme low water to over 200,000 horse power at a winter stage of high water, and, outside of Niagara Falls, is the largest water power now in use in the United States. Some of this power is now in use directly at the falls, where are to be found woolen, flour, paper, and other mills, but the Portland General Electric Company also transmits some 15,000 horse power of it to Portland, where it is used in lighting the city and turning the wheels of its factories. This power can be furnished cheaper than steam, and, as but a small portion of it is now in use, it offers Portland a very decided advantage as a manufacturing center, and is destined to maintain its supremacy. Its present position in relation to all other centers of manufacture in the Pacific Northwest is best shown by the fact that those interests which are regarded as all important in other centers are here lost sight of, though in fact greater than elsewhere, for the reason that they are not controlling. This is especially the case as to the lumber interest. Puget Sound is commonly supposed to be the great center of the lumber export trade, and yet Portland manufactures and exports from 50% to 75% more lumber than any Puget Sound city.

But probably the best index of the position which Portland occupies in relation to other trade centers of the Pacific Northwest, is its bank clearings. There are some elements in the bank situation at Portland which tend to make its clearings show less in proportion to its general business than in other trade centers, but they afford the best means of comparison that is obtainable.

The only seaports and trade centers which do sufficient business to warrant their being considered as in any sense competitors of Portland, are the cities of Seattle and Tacoma on Puget Sound. The general revival of business on this coast began with the month of

August, 1897. For the last four months of that year the clearings of the three cities were:

	Portland.	*Seattle.*	*Tacoma.*
September	$ 8,476,008	$ 3,215,011	$ 2,921,930
October	9,028,672	3,876,954	3,495,926
November	9,709,630	5,107,917	3,821,170
December	9,690,431	5,060,800	3,683,765
Totals	$ 36,904,741	$ 17,260,682	$ 13,922,791

But the business of the clearing houses of Portland and of Seattle and Tacoma is, as a matter of fact, conducted on a very different basis. In Portland the balances are paid each day in cash, and do not appear, either directly or indirectly, in the succeeding day's clearings. In Seattle and Tacoma they are paid by check, and pass through and form part of the next day's clearings. So that to ascertain the relative position of the several cities, these balances must be deducted from the clearings of Seattle and Tacoma. This being done, the showing as to these two cities stands thus:

	Exchanges.	*Balances.*	*Actual Clearings.*
Seattle—			
September	$ 3,215,011	$ 784,293	$ 2,430,718
October	3,876,954	1,369,939	2,507,015
November	5,107,917	2,241,785	2,866,132
December	5,060,800	2,012,355	3,048,445
Totals	$ 17,260,682	$ 6,408,372	$ 10,852,310

	Exchanges.	*Balances.*	*Actual Clearings.*
Tacoma—			
September	$ 2,921,930	$ 634,185	$ 2,287,745
October	3,495,926	762,922	2,733,004
November	3,821,170	809,833	3,011,337
December	3,683,765	681,301	3,002,464
Totals	$ 13,922,791	$ 2,888,241	$ 11,034,550

The abuse to which this system of clearing may lead, is well illustrated in the phenomenal growth of Seattle's balance from September to December, and their relation to the exchanges. Wishing to make a showing to the outside world of great increase in prosperity, and the exchanges alone being published in the reports of the commercial agencies, a system of accumulating balances was adopted, and is now being carried on, which gives her clearances the appearance of being nearly double what they in fact were or are when reduced to the same basis as those of other cities. During the four months given, the actual clearings of Seattle and Tacoma combined amounted to $21,886,860, those of Portland to $36,904,741. The banks of Portland are on a sound financial basis and very conservative. As three of these banks are only branches, it would be misleading to give the exact combined capital, as the capital employed. The face capital and reserve is near $20,000,000, the actual capital and reserve employed is probably between $5,000,000 and $10,000,000. The average deposits exceed $15,000,000.

What has been said above is based on the facts as they existed during the year 1897, with the late financial depression and its effects still in full force. But within the last few months a great change has taken place. The recovery in general business has been such that we are now, in this the first quarter of 1898, almost on the basis of the prosperous times that existed prior to 1893. There is every sign that the Pacific Northwest in general, and the city of Portland in particular, are entering on a period of growth and prosperity that will far exceed any of its predecessors, and it is safe to say that before these statements reach the great majority of the readers of this pamphlet, the figures given will have to be increased by several times, in order that they represent the true amount of Portland's trade and commerce.

Following each general business depression, has come a great movement of population westward. This has gone on from decade to decade, until the "Great West" of the Mississippi valley is filled, in so far as its settlement is practicable, and about the only section of the United States which is capable of sustaining a dense population, and is at the same time so sparsely settled as to offer the advantages of a new country, is that which is directly tributary to the city of Portland. Is it too much to expect that this section will receive, during the next four years, the tide of population that is sure to move with the coming of better times? We think not. In fact, though the spring is but just opening, this movement has already not alone set in, but has set in in a volume only reached in the advance stages of previous movements.

But there is another movement now in full force which must inure greatly to the advantage of the Pacific Northwest, and which will have about the same effect in stimulating the growth and prosperity of Portland as though it were a direct movement to and settlement of the country directly surrounding and immediately tributary to the city, that is, the movement to Alaska.

The discovery of gold deposits of phenomenal richness in Alaska has caused a great rush to that section, and it is estimated that between July, 1897 and March 1, 1898, fully 25,000 gold-seekers went into the Klondike valley solely on the reports of the rich finds there. But if reports from men, in other respects reliable, are to be believed, there are other sections of Alaska as rich as the Klondike, and we may look for the rush northward to continue for some years, probably until its population is numbered by the hundreds of thousands.

By reason of the nature of the country and the character of its climate, agriculture is impossible, and general manufacture impracticable in Alaska, and the population engaged in developing its mineral wealth must draw their supplies of all kinds from the outside. As the agricultural section nearest thereto, the Pacific Northwest will be the natural source of food supply, while its seaports, having ample railroad facilities and the advantage of proximity, will naturally be the base of other supplies. As the great center of collection and distribution, Portland is now holding this trade, and must continue to do so, and the settlement of Alaska will have the same effect in stimulating the growth and prosperity of the city as though its population were settled within the limits of Oregon or Washington.

During the years 1888 to 1892 Portland more than doubled its population. During the depression she did not lose ground. There is every reason to believe that the next four years will show a greater proportionate growth, than has ever before taken place, and that the present population of from 90,000 to 100,000 will exceed 200,000 by the year 1902.

CLACKAMAS COUNTY.

By the Oregon City Board of Trade.

Clackamas county has an area of about 1,500 square miles, or nearly a million acres. A little less than one half of this still belongs to the public domain. The eastern boundary is the summit of the Cascade mountains, and the county includes a few townships on the western side of the Willamette river. On the north is Multnomah county, in which Portland is situated, and on the south Marion, in which is Salem, the capital of the state. The area of Clackamas county considerably exceeds that of the entire state of Rhode Island, and it is infinitely richer in the variety and extent of its natural resources. Clackamas county has a population of about 25,000, while Rhode Island now has more than 350,000 inhabitants.

NATURAL FEATURES.

Extending from mountain peak to river strand it naturally follows that Clackamas county presents a great variety of topographical features and is adapted to a wide range of industries. There are river bottoms, level prairies, rolling uplands, the broken foothills, the rugged fastnesses of the mountains and every intermediate character of country. Part of the land bears a heavy growth of fir, part has alder, maple, larch, and other deciduous trees, and part is entirely treeless. Soils vary from a light loam to a heavy clay. From the banks of the Willamette, where snow seldom falls, to the perpetual ice fields of Mount Hood, which is also in Clackamas county, there is a great range of climatic conditions.

The streams flowing into the Willamette river in Clackamas county are rapid. Along their banks are large areas of agricultural land that is scarcely surpassed in productive capacity. The soil in these river bottoms partakes of the nature of alluvium, and is deep and rich. What may be termed second bottom land, lying on the benches between the river bottoms and the more distinctive upland, has a soil somewhat heavier than the bottoms. The more rolling land is a clay or clayey loam, with indications in some places of being derived from decomposed volcanic matter. All these soils are of great strength, and with the exception of a few spots of clay in unfavorable seasons, they are friable and easily tilled.

All the common farm products are successfully grown in every part of the county except far in the mountains where the altitude approaches the frost line. In many parts of the county semi-tropical crops are grown. Prunes, peaches, apricots, quinces, grapes, watermelons, and tomatoes are among these. The ordinary cereals yield enormous crops, there being many instances where more than 60 bushels of wheat per acre have been harvested, not merely in selected garden patches but in large fields. The usual harvest, however, is only about half that number of bushels per acre. Other grains are correspondingly prolific. It has passed into proverb that Willamette valley crops never fail.

FRUIT RAISING.

Along the courses of the Pudding, Molalla, and Clackamas rivers, and some of their larger tributaries there is considerable prairie land, or land lightly timbered, which can hardly be excelled for peach and prune orchards. Farmers in those localities are just becoming aware of the possibilities of orcharding, and many thousand trees are being set every year. In a few instances the orchards have already come into bearing and the results justify every hope of making this a great fruit country.

Clackamas county is taking a leading position in the advancement of the fruit growing interests of the Northwest. Its nurseries send stock throughout the Pacific Northwest, including British Columbia. Many of the large land claims that have lain for years largely wild or with very indifferent cultivation are being divided into smaller tracts and given over to systematic fruit culture. Five or ten acres in fruit will yield as much profit as a large farm in grain, the net profit usually ranging from $200 to $1,000 per acre.

Careful cultivation has rarely been bestowed on Oregon fruits and vegetables, and it is a new era that is opening when these products shall receive the attention that is due them from the husbandmen of the far Northwest. The fruits that grow to advantage in Clackamas county include apples, pears, plums, peaches, prunes, apricots, quinces, cherries, blackberries, raspberries, currants, gooseberries, strawberries, and grapes. Even figs reach maturity in Oregon City, though the climate is not sufficiently tropical to make them a reliable crop here. Blackberries, raspberries, huckleberries, strawberries, plums, and crab apples grow wild in abundance.

HOPS AND POTATOES.

Many thousand bushels of potatoes are annually sent to market from Clackamas county. Even merchantable sweet potatoes are raised here. The soil near the streams is best adapted to potato growing, and with very ordinary care a large yield of tubers may safely be reckoned on. The California market receives a large share of the Clackamas county crop.

The rich bottom lands are to a considerable extent being covered with hop yards. The growing of hops is becoming one of the leading branches of agriculture in the Willamette valley. Clackamas county is among the first half dozen counties of the United States in the amount of hops produced. Buyers in London, England, have agencies in the hop yards of this county who secure the bulk of the crop and pronounce the product of a quality that is not often excelled.

Careful estimates, based on years of observation, place the actual average cost of producing hops at 7 cents a pound. Twenty cents per pound is by no means an unusual selling price. The usual yield per acre when the crop has been well cared for is between 2,000 and 3,000 pounds.

REAL ESTATE VALUES.

In a country being settled and improved as Clackamas county is, real estate values must be constantly changing. There are, of course, lands of all grades and values from $200 a foot front on Main street, Oregon City, to government land that may be had in the Cascade foothills by simply occupying it in accordance with law.

Residence property may be purchased in Oregon City for $400 to $900 per lot, 66x105 feet, within 4 or 5 blocks of the business center of the town. Within 12 blocks of the postoffice eligible lots may be had for about $200 each. On the west side of the river the Portland General Electric Company owns 1,600 acres, only a small portion of which is platted. However, there are a few tracts on that side owned by other parties in which lots sell at $100 to $300, much depending on the location.

At Oswego, a small town on the west bank of the Willamette, five miles below Oregon City, is an iron manufacturing plant, in which $1,500,000 are invested. Here is the only cast pipe foundry west of St. Louis, Missouri, and the only iron smelter in operation on the Pacific coast. On the east side of the river the villages of Milwaukee, Clackamas, Willsburg and Sellwood are between Oregon City and Portland. It may be assumed that land is valuable through this section on both sides of the river. Property still covered with timber on or near the river between Portland and this city sells for $100 to $500 an acre, according to location.

Choice prairie and bottom lands in the southern part of the county are worth as high as $100 an acre. These lands are usually put in fruits or hops rather than in general farming. Farming lands grade down to $10 an acre or even less for partially improved farms. It all depends on the location and quality of the land and the degree of improvement. Near Oregon City acre property is up as high as $1,000 and $1,500 an acre.

ABUNDANT MINERAL WEALTH.

Clackamas county promises to come to the front as a producer of minerals. In the extreme southern part of the county a ledge of gold-bearing rock has been discovered. The sands of nearly all the mountain streams of the county carry considerable gold There are coal outcroppings in the foothills in the southwestern part of the county and indications of coal and oil at several other places. Iron mines have been extensively worked in the northern part of the county. Platinum has been discovered on the bank of the Clackamas river, three miles from Oregon City, and there seems every probability that the find will prove a very valuable one.

SEEKERS OF PLEASURE AND HEALTH.

While the teeming streams and picturesque scenery entice camping parties to many pleasant places in this delightful country, the chief summer resort is Wilhoit Springs, whose famous water has brought the glow of health to many a sallowed cheek. It is reached by a drive of 20 miles from Oregon City, through an interesting country to the mountain foothills. Hundreds annually seek the springs, where a large park accommodates any number of campers and a hotel supplies accomodations for those who prefer to live there.

In the mountain region there is plenty of big game, and if one court danger he should press well into the heart of the range, where cougar, bear and elk abound. The Mongolian pheasant, transplanted from Asia and now so plentiful in the Willamette valley, is a game bird of rare quality, obtainable in nearly every field and thicket. Trout fill many of the mountain streams. The gamey salmon brings fishermen from far and near to hook them at the falls of the Willamette and in other of the larger streams of the county. The salmon fishing brings several thousand dollars to net fishermen every spring, but this, of course, is a business, not a sport. Seven miles up the Clackamas the United States maintains a salmon hatchery and the state fishermen are arranging to build a hatchery at the headwaters of that river.

OREGON CITY.

Oregon City is situated on the Willamette river, about 24 miles above its confluence with the Columbia river, and half that distance above the city of Portland. A basalt ridge extends across the valley, connecting the Cascade and Coast mountain ranges, and the Willamette river, tumbling over this basalt ledge at Oregon City, forms the falls that induced the locating of the town here. The falls are semi-circular in shape and measure about half a mile from shore to shore. There are 3 or 4 small rock islands at the brink of the cataract, dividing the stream so that the water does not all pour over in one body The vertical fall at mean low water is 40 feet. Factories are located on both sides of the river, but the main business portion of the city is on a flat on the east side between the stream and the rock bluff that rises vertically 80 feet two blocks back from the river. This bluff enters the city at its south side and extends nearly two-thirds the distance through the town, parallel with the river.

Strangers visiting Oregon City are likely to think the whole town is crowded between the bluff and the river. But back on the bluff is a large tract with a gentle slope toward the Willamette, which is covered with residences, and many business houses are also located there. The eastern part of town is somewhat broken. In the southern part is another elevation reaching an altitude of about 350 feet from the river, which is a sightly locality for residences. A view of the river and an interesting stretch of country, even to Portland and beyond, is spread out before the gaze of the observer from that point. On the west side of the river the elevation is even greater than the east side, though it is not marked by precipitous cliffs except on the immediate bank of the stream. The outlook from that locality is upon nearly the entire city and the mountain scenery that is so beautifully accentuated in the towering peaks of the Cascade range. A suspension bridge 1,000 feet long spans the river at a height of nearly 100 feet above the water.

The picturesque beauty of the locality is one of the greatest attractions at Oregon City. The falls are not simply a series of rapids, but the whole mighty volume of the Willamette river plunges down a precipitous cliff of solid basalt, forming a cataract that is truly magnificent in its beauty and power. Below the falls the river flows between vertical walls of solid rock 20 to 50 feet tall, in which that peculiar columnar form which basaltic rock sometimes take is seen. At this point the river flows nearly northeast, receiving the Clackamas, and turning to the north just beyond the northern limit of the city. The two elevated shelves on the east and south and the rising ground on the west quite change the monotonous aspect presented by most towns, and give from every part of the city command of an outlook of charming beauty and grandeur. The banks of the river, both above and below Oregon City, still carry, to a considerable extent, their native forests, though between this city and Portland there is less timber and more farms and orchards than in the other direction.

SIZE AND CHARACTER OF THE TOWN.

There are fully 6,000 people resident at Oregon City. Not all of these are within the official limits of the town, but they are within a radius of a little more than a mile from the Oregon City postoffice, and are included in the suburban communities—Canemah, Ely, Gladstone, Clackamas Heights, Park Place, Weslynn, Windsor, and West Side. The prosperity of these is linked to that of Oregon City, and the progress of the whole depends in a large measure upon the development of the water power at the falls.

Public school facilities include 6 school houses and 22 teachers, all the schools being graded. The Catholics have a parochial school also. There are Baptist, Catholic, Congregational, Episcopal, German Evangelical, Methodist, Presbyterian, Lutheran, and United Brethern churches, and the talent in the pulpits is quite rare in towns of this size. Of the social, fraternal, and benevolent orders there are lodges of Freemasons, Odd Fellows, Knights of Pythias, United Workmen, Foresters, Redmen, Woodmen, Grand Army, and cognate organizations, a military company, and several smaller social clubs.

Oregon City has two banks, employing a capital of $165,000. The United States land office for the district, embracing 11 counties in Northwestern Oregon, is located here, and there are but 8 in the United States that do a larger business. The town has 8 weekly newspapers, a first-class theatre, 4 hotels, 2 livery stables, 8 public and 4 lodge halls, and a large number of mercantile houses.

Being the seat of justice of so large a county, Oregon City has many advantages in the way of trade and influence that it would not otherwise have. The county court house is a fine structure that cost $60,000. The free suspension bridge over the Willamette river at this point was built by the county at a cost of nearly $30,000.

About $50,000 are paid out monthly in wages in Oregon City. This money goes to employés of the electric company; of the woolen mill, the annual output of which exceeds $750,000; of the flouring mills, having a capacity of 1,100 barrels a day, and sending their product to Liverpool and China; of the paper and pulp mills, turning out an annual product of about 30,000 tons, one of the mills being the largest on the Pacific coast; of an excelsior and shoddy mill, two sawmills, two sash and door factories, a machine shop, a soap factory, a cement mill, a wooden-pump factory, an ice factory, and a number of smaller manufacturing and repair shops. The value of the annual product of these manufacturing plants is about $3,000,000.

TRANSPORTATION FACILITIES.

In the matter of transportation Oregon City has practically the same facilities that Portland has. It is only 12 miles to Portland, and steamers ply regularly on the river at all seasons of the year. At Portland freight is transferred to ocean ships for shipment to coast points or to foreign countries, or to cars on transcontinental lines leading to the interior country and to the East. Then the Southern Pacific railroad passes through Oregon City, and for commodities that may be shipped by rail to better advantage than by boat there is every facility for handling. The Willamette river is navigable 118 miles above Oregon City, and several steamers ply on the upper river at all seasons of the year.

Oregon City is divided into two wards and is governed by a mayor and council of eight members, whose term of office is two years. The town has a good water works system, supplied from the river above the falls. It is under the control of a commission, consisting of three members, one of whom is elected annually for three years, and it is kept separate and distinct from other branches of the city government. The water service yields considerable revenue to the city over and above the cost of maintenance. The city has an electric light service, both arc and incandescent, and a telephone exchange. It has brick paved and graded streets, and an adequate sewerage system, both of which it is extending. The total debt of the city is within $40,000, $30,000 of which is bonded. The town is in a thriving condition and it holds every promise of rapid advancement.

WATER POWER.

United States engineers report that the Willamette river discharges into the Columbia 15,000 cubic feet of water per second. The only tributary it receives below Oregon City is the Clackamas river, a comparatively insignificant stream. The Clackamas does not discharge more than 2,700 cubic feet of water per second. Both these computations are for the lowest stage of the river during the dry season. Thus the volume of water flowing over the falls is 12,300 cubic feet per second. The vertical height is 40 feet. So the capacity of the water power of the Willamette falls at the lowest stage of water is about 56,000 horse-power. The estimate of power based on the discharge at the mouth of the river, about 24 miles below the falls, is the most accurate statement obtainable, and it cannot vary much from the truth. During most of the year the power is several times the minimum above stated.

COMPARATIVE WATER POWER CAPACITIES.

A comparative statement of the capacities of various well known water powers will afford some idea of the relative importance of the power at the falls of the Willamette. Here is a statement compiled from official and other reliable data:

Seat of water power.	*Horse-power capacity.*
Oregon City, Oregon	56,000
Minneapolis, Minnesota	20,000
Holyoke, Massachusetts	19,000
Manchester, New Hampshire	11,000
Lawrence, Massachusetts	12,000
Lowell, Massachusetts	11,845

There has been comparatively little development of the Oregon City water power. About 8,000 horse-power is now used in manufacturing here. The most important improvement in the matter of turning the power of the falls to commercial uses has been made by the Portland General Electric Company. This company was incorporated in 1892 with a capital stock of $4,250,000. It has constructed a station whose capacity is 12,000 horse-power, and furnishes electricity for lighting Oregon City, and transmits the current to Portland, a distance of 12 miles, and lights the entire city. It also furnishes electric power to operate a line of street cars between Oregon City and Portland and street car lines in the city of Portland. It supplies currents in any quantity for lights, power, and heating, and furnishes motive power for running everything, from the largest factory to ventilating fans and sewing machines. At the present time the manufactories, the elevators, and the various kinds of machinery in Portland use about 2,000 electric horse-power, which is generated at Oregon City.

WASHINGTON COUNTY.

From Oregonian, January 1, 1898.

Population	18,500
Acres under cultivation	78,520
Bushels of wheat	650,000
Bushels of oats	450,000
Bushels of barley and rye	20,000
Tons of hay	40,000
Bushels of corn	1,500
Pounds of butter and cheese	60,000
Pounds of tobacco	25
Pounds of hops	1,000,000
Bushels of potatoes	400,000
Bushels of apples, prunes, and plums	200,000
Feet of lumber	12,000,000
Pounds of wool	40,000
Number of sheep	7,127
Number of hogs	3,183
Number of horses	4,526
Number of cattle	8,432

In the long ago, old ocean reached out an arm among the hills, and, with mighty hand, scooped out a basin west of Portland, where for ages the salt water, in peaceful mood, lapped the fir-clad hills or stirred by winter winds, lashed the sides of restraining beaches. This was not always to be, for the winter rains carried to the inland lake tons and tons of silt, till there came a day when the sea pulled in her arm, and folded it on her face. Where before had been water, now was dry land. A drainage system was carved through the level plain, the fir burr from the mountain lodged in the soil, the acorn sprouted, and Washington county had a geographical existence.

The county is entirely surrounded by hills, saving where the Tualatin breaks through to the Willamette, a few miles above Oregon City. Thirty miles one way and 40 miles another is the length of the measuring lines. The county is a lake bed and the soil is a silt, renowned the world over for its fertility. How deep is it? No one knows. At Hillsboro a well 350 feet deep has been bored, but the bedrock was not touched, nor did a bowlder blunt the point of the drill. At Beaverton, near the eastern side of the lake bed, a well over 400 feet was dug, but no bottom. Down went the drill 100, 200; yes, 300 feet below the present level of the sea, but naught was found save sand and clay and water. Such a geological formation, and the temperature of the state at large, with 45 inches of water, mind you, water—not snow—each 12 months, and what a paradise for the farmer! Wheat and oats, and barley and corn, potatoes, beets, flax, with apples, pears, peaches, and prunes grow and reward the husbandman.

But nature has done more for man. This garden spot is near a distributing point to the nations. The farmer can from most parts of the county start in the morning with his loaded wagon, go to market, sell his produce and return home for supper. If he finds that he has work at home for his team, he can ship his crop on the rail cars that pass his door, or at most a few miles to one side. And the very fact that he can, in his own wagon, with his own good Percheron or Clyde draft horses, transport his own freight, keeps the railroad freight tariffs at a minimum.

The chief industry of Washington county now is and for some years to come will be farming—plowing, sowing, reaping. Some stock will be grown to be sure, but the pastures are too valuable for fields; the population is too dense for great herds to roam and multiply, and fatten. The market for the cereals and their products, which Portland is finding in Asia, is giving an impulse to the farmers in Washington county which they never before had.

Manufactures may be planted here, and we will welcome them, for we want to feed the operatives. We can do it so economically and so bountifully that the artisan's tables will groan under the good cheer we can send from our fields, our gardens, our orchards, and our pastures. True our pastures are narrow, but they are good exercise grounds for our stall-fed bullocks that furnish juicy steaks for a happy and contented army of operatives.

We have shown the past summer by an experiment systematically conducted, that no county in the state furnishes beets whose juice has so high a per cent. of purity, and but two counties where the per cent. of sugar is greater. We sent beets to the station that were a fifth sugar and nine-tenths pure. These were grown on our wheat land, of which we have thousands of acres. Why do our people not put up sugar factories? Because they are farmers, and have not hoarded the vast sums of money required for building a plant. But they can raise the beets, furnish good fir wood, a fuel next to coal for making steam, at $1.25 per cord, and point to an inexhaustible supply of pure water, with Portland, the shipping point, only 18 miles away.

Hops grow here—the best in the state. They are intelligently handled, so that buyers hunt out the pungent bales, and pay a higher price than they offer other growers.

Can a stranger buy land in that favored locality? Yes. Our land-holders realize that they have more acres than they can till, except they call strangers to assist them. While the owners are not running after buyers, they will divide their holdings for a moderate price, and welcome the immigrant to their schools and churches, already established.

YAMHILL COUNTY.

By William Galloway.

I am under obligations to Mr. E. A. Wood, county assessor, and others who have kindly furnished statistical information of the resources of Yamhill county, which is centrally located in the Willamette valley on the west side of the Willamette river, and contains about 500,000 acres of land. Its southern boundary is very near the 45th parallel of north latitude, while its western boundary, the summit of the Coast range of mountains, overlooking the Pacific ocean, is distant from the Willamette river, its eastern boundary, about 30 miles. The soil and climate are peculiarly adapted for the production of the cereals, and all kinds of the hardier fruits. With more than 300,000 acres capable of the highest state of production, less than half that number is at present under cultivation. This county is finely timbered, well watered, and possesses a most excellent system of natural drainage. Along the western boundary, with a low grade and easy of access, is a strip of timber land, 30 miles long by 10 miles in width, covered with the finest quality of fir, cedar, hemlock, and larch, while on the foothills, along the streams, and in the bottoms, is an ample growth of deciduous timber, such as oak, ash, maple, alder, etc.

The two branches of the Yamhill river, known as the North and South forks, receive their supply respectively in the northwestern and southwestern portions of the county, whence they course diagonally to their junction very near its geographical center; from there the river continues diagonally to the Willamette, and is navigable a portion of the year to McMinnville, a distance of 20 miles, thus furnishing excellent facilities for cheap transportation to a large portion of the county. The streams are confined within well-defined channels, with the adjacent lands elevated and rolling, thus giving the best and most desirable system of natural drainage. Hence, in this county, there is but little white or overflowed land.

The Southern Pacific has two standard-gauge and well-equipped lines passing centrally through the county, crossing, but nowhere paralleling each other, thus accommodating every section, and making about 60 miles of track in the county. Over these lines six passenger trains and one combination train, with ample freight trains, pass daily.

As a habitation for the home-builder, no section has better natural advantages than Yamhill county. The altitude, ranging as it does, from 200 to 1,000 feet, gives a pleasing variety of scenery and climate; the streams, supplied from the perennial springs of the Coast range of mountains, are pure and healthful, and the nearness to the ocean, with its warm Japan current, gives cool nights in summer and warm days in winter. If the husbandman wishes to raise the golden cereals to the highest state of production, he will find his Eldorado in the broad and fertile valley land of the interior. If he wishes to engage in the cultivation of hops of the first quality, yielding from 1,500 to 2,000 pounds per acre, he can find ample means in the unsurpassed bottom lands along the streams; or if he prefers to cultivate the apple, pear, cherry, prune, plum, grape, nuts, and almost all kinds of small fruits, he can be suited in the foothills, on the mountain side or elevated lands to be found everywhere.

In some localities peaches do well, and are of excellent flavor and quality, but are not a sure crop, hence their cultivation is not advisable, unless in favored localities. The hardier kinds of fruit trees thrive on any well-drained land, but owing to the better protection against late spring frosts, the higher lands are preferred for horticultural purposes.

The staple production is wheat, with other cereals of secondary consideration. Last year the estimated export of wheat was 1,000,000 bushels, valued at $750,000; oats and barley, 628,000 bushels, valued at $160,000; hops, 1,350,000 pounds, valued at $168,750; 100,000 bushels of potatoes, valued at $25,000; wool, 300,000 pounds, valued at $39,000; dried prunes, 100,000 pounds, valued at $150,000; and 30,000 cords of oak wood, valued at $60,000.

Other products and manufactures of the year are: Lumber, 600,000 feet, valued at $40,000; brick and tile, valued at $12,500; brooms, valued at $1,800; sash and doors, valued at $12,000; poultry and eggs, valued at $35,000; harness, valued at $20,000; apples, pears, and prunes, not dried, 177,000 bushels, valued at $25,500; butter and cheese, 200,000 pounds, valued at $80,000; hay, 20,000 tons, valued at $160,000; job printing, $3,000.

Value of real estate, not including government, school, and railroad lands, as follows: Land under cultivation, 116,670 acres, valued at $2,148,796; not under cultivation, 208,378 acres, valued at $702,871; town lots and improvements, valued at $796,700.

Livestock—Cattle, 7,928 head, valued at $95,136; sheep, 23,951 head, valued at $57,902 and 6,198 swine, valued at $24,772.

Other statistics—Population, 16,000; number employed in manufacturing, 500; number of school children, 5,000; number of public schools in the county, 85, giving employment to over 100 teachers; number of churches, 31; number of newspapers, 11; amount of bank deposits, $269,000.

Yamhill county contains seven incorporated towns, viz.: McMinnville, North Yamhill, and Amity, situated on the Portland and Corvallis line of railroad, and Newberg, Lafayette, and Sheridan, on the Portland and Sheridan line; with Dayton, on the Yamhill river, at the head of navigation during the entire year. There are three first-class higher institutions of learning in the county, viz.: McMinnville Baptist College, Pacific College, at Newberg, and Lafayette Seminary.

TILLAMOOK COUNTY.

By D. DeKalb Bowman, Editor of The Searchlight.

Tillamook county is one of the comparatively new counties of the state, and, considering its climate and resources, one of the very best.

CLIMATE.

Situated in the northwestern part of the state, and washed by the waters of the Pacific tempered by the Japan current, its climate is exceptionally mild and pleasant. The heat of summer is tempered by the cool ocean breeze, and the rains of winter are so warm as to cause little discomfort; and, on the other hand, they promote the growth of grass and grains, and insure plenty of feed for stock the year round, with but little need of any additional feed. Snow rarely falls, and never lies for any length of time upon the ground, except on the highest mountains. The lowest temperature reached thus far this year was 24° above zero, the average temperature for the winter months being about 45°. The summers are delightfully cool and pleasant. The thermometer varies in summer from about 50° to 85°, the last named figures being reached on but few days in the year. The nights are always cool. There is an abundance of rain in winter, and occasional showers during the summer months, sufficient to insure crops without fail.

PRODUCTIVENESS.

The soil of Tillamook is unequaled for richness and depth. The prairies are of comparatively small area, but are excellent for grass. The rich bottom lands are, however, far richer, and will produce any kind of crop desired, but are especially adapted to root crops. Potatoes, beets, carrots, etc., yield enormous crops, while oats, clover, timothy, and all kinds of grasses produce astonishing results. Wheat and corn can be grown profitably, but the land is far more valuable for other purposes. The whole country is abundantly watered by rains and clear, never-failing mountain streams, and artificial irrigation is unnecessary and unknown.

HEALTHFULNESS.

Owing to the above-named conditions Tillamook county is one of the most healthful places on earth. Malaria is unknown, and diphtheria, typhoid fever and kindred diseases never occur where even the most ordinary care is taken to establish good sewage. Pneumonia is exceedingly rare, and consumption, except in some cases that are brought here, is almost unknown.

RESOURCES.

The resources of Tillamook county are numerous, but consist mainly in dairying and fishing. Its magnificent forests of spruce, fir, larch, cedar, and hemlock have been scarcely touched by the woodman's axe, and, aside from the comparatively small amount of lumber shipped by the Nehalem mills and the Tuckee Lumber Company at Hobsonville, only enough lumber has been sawed for home consumption. Recently additional mills have been established in the county, and now Nehalem, Hobsonville, Netarts and Tillamook all have mills that are engaged in shipping lumber to San Francisco. It is estimated that last year's output was as much as 20,000,000 feet. The Nehalem river and Tillamook bay are excellent harbors, and there is a splendid opening for new mills at both places.

The resources of the county can perhaps be best estimated by the following table, showing the total output, so far as obtainable, for 1897:

Articles.	*Amount.*	*Value.*
Lumber, feet	20,000,000	$ 120,000
Livestock, head	2,000	30,000
Fresh fish, tons	100	6,000
Salt fish, tons	100	8,000
Canned fish, cases	75,000	225,000
Wool, pounds	10,250	143,500
Furs, pounds	2,000	1,000
Hides, pounds	50,000	3,000
Eggs and poultry	--------	5,000
Dairy products, tons	1,000	500,000
Total value		$ 1,041,500

But the principal industry of this county, and upon which it can depend for unfailing prosperity, will always be

DAIRYING.

For this industry Tillamook county is doubtless the best section of country in the United States. Wherever the land is cleared, it is at once covered with luxuriant natural grasses that are literally green and nutritious the year round, and cattle require comparatively but little feed in winter, there being no snow and the grass continuing its growth. Owing to the excellence of the feed and the skill employed by our dairyman, Tillamook butter has become famous all over the coast and demands the highest price in the markets. It is estimated that the dairy product of this county amounted last year to 1,000 tons, valued at $500,000. There are 10 creameries in the county, and the dairyman can either sell his milk to the creameries, or make it into butter and cheese. Tillamook cheese has a reputation equal to Tillamook butter, and the demand is always in excess of the supply. Good land suitable for dairying and within easy reach of creameries can be purchased at reasonable figures, ranging at from $10 to $75 per acre.

FISHING.

Fishing is carried on extensively, and there are large canneries located at different points in the county. Nehalem has 2, Tillamook has 1, Woods and the Siletz river have 1 cannery each. Besides the product of the canneries large quantities of fish are shipped, fresh and salted.

The only variety of fish thus far shipped out of the county are salmon and steel head trout. The almost inexhaustible banks of halibut, rock cod, and other deep sea fishes, known to exist, remain untouched.

OTHER INDUSTRIES.

Aside from these principal industries there are others that will in time develop into considerable importance. Fruits, especially apples, pears, plums, prunes, and all the varieties of berries, especially the latter, grow in the greatest abundance, and with proper cultivation bring a never-failing crop.

Cranberry culture in certain sections of the county has been commenced on a large scale and bids fair to yield handsome returns. The Tillamook cranberry is pronounced by connoisseurs the best berry grown on the coast. Native berries, such as huckleberries, blackberries and salalberries grow in great abundance.

One of the new industries of this county that promises to develop into large proportions is the keeping of bees. The myriads of wild flowers that grow here furnish rich foraging ground for bees, and the honey is noted for being of unusually fine flavor and clearness. As a land literally flowing with milk and honey, Tillamook comes nearer filling the bill than any other we know of on earth.

On the Nehalem river large beds of coal are known to exist and in the near future coal mining will be added to the other profitable industries of the county.

HUNTING AND FISHING.

For the sportsman Tillamook county is a veritable paradise. All kinds of game abound in the valleys, and in the mountains. Elk, deer, bear, panther, foxes, beaver, and all the smaller animals common to Western America, ducks, geese, brant, plover, snipe of all kinds, together with pheasant, grouse, quail, pigeons, and all other game birds are to be found in greatest abundance. The streams of Tillamook are famous for trout of all kinds, and the bays abound with salmon, sea trout, flounder, codfish, and all kinds of shell fish. The poor man need never be afraid of going hungry in this county.

POPULATION.

The population of Tillamook county is mostly a rural population. It is estimated that it amounts to about 5,000, of which about two-thirds is in the rural districts.

TOWNS.

Tillamook City, the county seat, has a population of about 1,000. It has all the business houses usual to a town of its size, most of which carry large stocks of goods. The usual shops, two good hotels, and two newspapers. The town has a fine system of water works, a good telephone system connecting the entire county at Forest Grove with the Western Union telegraph system, and an electric light plant. It has four churches, a fine graded school, and an excellent academy conducted by the Catholic Sisters of the Order of St. Cecilia, and capable of imparting a finished education. There is also a good private school. Nehalem, Bay City, Beaver, and Woods, are all flourishing villages.

TRANSPORTATION AND ROADS.

The public roads of Tillamook are said to be the best of any in the entire state. They were built at great expense, and are being pushed forward as rapidly as needed.

Most of the shipping of agricultural and dairy products is done by boat via Astoria to Portland. Lumber is shipped mainly to San Francisco. Boats have not run very regularly in the past, but arrangements will soon be made for a first-class service equal to all demands. Two stage lines carry passengers, the Forest Grove and North Yamhill line.

PUBLIC LANDS.

There is still quite a large amount of good land open to settlement under the Homestead Act, and also many valuable timber claims that await those who want them. The land open to homesteading is excellent land, but covered with timber and brush which must be cleared away, at least in part, before it becomes of value to the farmer, but once cleared it is as good land as can be found anywhere else on earth.

Take it all in all there are few sections of the country that offer the inducements to settlers that this county does, and any man with sufficient means to buy a small ranch and stock can do well here. A single man with $500, or a married man of family with $1,000, can do well. There is an excellent opportunity here for the investment of capital for any one wishing a reasonable interest, or who will be satisfied with fair increase in value. Laborers without any means whatever will perhaps do better elsewhere. Parties desiring additional information can obtain it free of charge by writing to *The Headlight*, Tillamook, Oregon.

MARION COUNTY.

Marion county—occupying a commanding position in the heart of the great Willamette valley—lying on the east bank of the lovely Willamette river, famed in poetry and in song—and extending eastward to the snow-capped summit of the Cascade range of mountains—for natural resources, prolific soil, diversity of products, equable climate, and charming scenery, challenges comparison with the world's most favored spot.

Bounded on the north by the Willamette river and Butte creek, which separates it from Clackamas county; on the east by Clackamas county and the Cascade mountains, which separates it from Wasco county; on the south by the Santiam river and the north fork of the Santiam, separating it from Linn county, and on the west by the Willamette river, Marion county lies in the shape of the letter L, the stem extending to the summit of the Cascades. From north to south the county is about 40 miles in width, at its widest point, while the narrow strip to the east is scarce a dozen miles across. Marion county contains, including valley, prairie, and mountain lands, about 900,000 acres, of which 560,000 are deeded lands. There are two main divisions of the county, the mountain and the valley. The latter extends from the Willamette river to the foot of the Cascade mountains, a distance of about 15 miles. The mountainous portion contains some 14 townships of practically unsurveyed land, lying in a strip 12 miles north and south, by 40 miles east and west, and comprises all classes of land, from rich narrow valleys in the passes up, through all the grades of rolling, hilly, and broken, to that of rock-bound cañons and inaccessible peaks. It is generally heavily timbered, and is even now valuable for its lumber supplies. The western portion of the county is comparatively level, and may be classed as good farming land, with few exceptions, and contains approximately about 450,000 acres. This tract embraces a great diversity in the character of the soil. For the most part it is productive. This variety of soil may be considered a desirable feature, as it enables the farmer to diversify his crop, and lengthens the period of seed time and harvest more than would be practicable under ordinary conditions of uniformity of soil. Thus, the hilly and rolling lands can be plowed almost any day in winter or early spring, and the seeding done before the level lands are dry enough to plow; then, later in the season, the rich bottom lands are plowed and seeded, thus giving ample time for getting the crop in, and extending the harvest time from July to October. This immense advantage being thus secured to the farmer by the variable soil and equable climate of Western Oregon.

From the Willamette river eastward to the mountains of timber is a rich region, adapted to agriculture and horticulture. To the east of Salem lies Salem prairie. North of this lies Howell prairie. The next wide stretching area of farms and orchards to the north is known as French prairie. East of the prairie region, and tending north and south through the county, are a series of undulation known far and wide as the Waldo hills. Between these and the foothills of the Cascade mountains lie broad ridges of upland, hill, and vale. North of Salem the land is level and agreeably diversified with timber and prairie, forming the rich agricultural lands of Labish and Mission bottoms. That portion of the county lying south of Salem is divided into two parts by Mill creek, which runs in the southern portion of the county, at the base of the Cascade range, and flows diagonally across this section emptying into the Willamette at Salem. The valley of Mill creek varies in width from half a mile to three miles, and the greater portion of it is prairie land. A part of the valley proper is quite gravelly, though generally productive, while the lowlands adjacent are very rich and among the most valuable in the county. To the east of Mill creek valley is a rolling country. A peculiar feature of the topography of the county is the range of hills commencing a few rods west of the village of Marion, and extending in a westerly course for 7 or 8 miles, where it unites and blends with the Salem hills. This range is from 300 to 500 feet high, and varies in width from half a mile to two miles. The land is a red alluvium, well suited to wheat growing and fruit raising. On the north is a level prairie country, bordering Mill creek; and on the south a level region, partially open land, and the remainder timbered with oak and fir.

The brightest prospects for Marion county's future prosperity lie in her fruit. This is one of the industries that has been developed to quite an extent during the past few years, but which is yet in its infancy as far as possibilities are concerned. All the small fruits —strawberries, raspberries, blackberries, currants, gooseberries, cherries, etc.—grow here to perfection in size, flavor, and quantity. Strawberries grow to immense proportions, and earlier varieties bring a good price in market; in fact they all find ready sale as long as they last. Cherries also are exceedingly large and fine. Persons residing in the Eastern states have no real conception of the size and general qualities of the Willamette valley cherry. The various other small fruits are no less remarkable for profusion and perfection. Large quantities of cherries, blackberries, and raspberries are dried and shipped to various markets, bringing a very satisfactory price. The demand for this dried fruit is constantly increasing.

The various large fruits do well in this section. While in many favored places the peach is growing with gratifying success and is equal in flavor to the best grown in any climate, yet peach culture is not advised with assurance of entirely satisfactory results.

Our apples are noted for their size, cleanliness, and beauty far and near. The man who selects suitable trees and plants an apple orchard in an intelligent manner, takes care to keep it free from pests, is sure to realize handsomely on his investment. Whether green or evaporated, the sound apple will always find a ready sale at a good price, and well kept trees yield splendidly in this valley.

In no part of the world does the pear grow to greater perfection than in this vicinity, the Bartlett being the favorite for general purposes, though the Winter Nellis is very profitable, and there are several other varieties which are quite satisfactory. Pear trees grow to a great height here and yield heavily.

Plums of different varieties—the Peach plum, Egg, Bradshaw, Golden Drop, Columbia, Green Gage, etc.—grow to a size that makes Eastern people stare in wonder. They ripen in good season for early shipment and find a welcome in Eastern markets.

We now come to the fruit that is attracting the most attention, and is destined to rank first in importance in these parts—the prune. Marion county is the natural home of the prune, and in no part of the world so far known does it prosper so completely. The principal varieties cultivated here are the Italian, the Petite or French prune, and the Silver prune. The last named is a delicious fruit, sweet as honey when ripe, but somewhat difficult to save properly, so it is not considered a paying prune to raise in large quantities. The Petite is small, as its name implies, but is very sweet, is hardy, and a prolific bearer. It is a great favorite. But the prune, to which the grower is inclined to hang for reliable profit, is the Italian. The black color covered with a beautiful bluish white bloom. In drying or evaporating they yield 33½% of dried fruit ready for market, coming out of the dryer large, black, and sweet. Neither the tree nor the fruit is subject to disease, and the yield is large. These prunes do well on any of the side hills or table lands within 30 miles of Salem in any direction, and it is really a source of great delight to make a summer tour of the prune orchards which abound in the vicinity of Salem.

A few years ago, there was great fear that the prune crop could not be properly handled, saved, and marketed, because the facilities for drying were so limited that growers were forced to depend upon the sale of the green fruit. Yankee ingenuity has changed all that. Now there are plenty of driers and not a prune need go to waste unless by sheer carelessness. There was a heavy crop the past year, but it all reached or will reach a good, satisfactory market.

Suitable land for orchard purposes—apples, prunes, plums, pears, and small fruits—can now be had anywhere in Marion county at very low prices, in comparison to past and prospective future prices, and it takes but a few years—4 on an average—until the orchard will begin to return the price of the land. There never was a better opportunity than now exists to secure a footing in the Willamette valley.

The question of finding a market for our green and dried fruits was also solved to a great extent the past season. During 1897 there was shipped out of Marion county to Eastern markets 50 carloads of green fruit, which breaks the record for any one season. More new evaporators were put in last summer than during any preceding season, largely increasing the facilities for drying. Over 1,000,000 pounds of dried prunes and apples were saved. In Marion county are 5,000 acres set to prunes, 2,500 acres being put out by one firm. All of the prune orchards are young and many are just coming into bearing, and when the maximum yield is reached the output will be enormous. Under such a showing and with the probabilities now in sight, the future for fruit and vegetable production in this part of the Willamette valley looks exceedingly bright and encouraging.

For all-around agricultural purposes, there is no more fertile valley in the world than the valley of the Willamette. All authorities who have investigated the matter agree upon this point. Marion county occupies a commanding central position in this richest of vales. For the most part the soil is a loam, dark and rich, with a subsoil of clay. The bottom lands along streams consists of rich deposits of alluvium and are wonderfully fertile and valuable to a great degree. The soil of the upland is a red, brown and black loam, and produces an excellent quality of natural grass, as well as splendid crops of grain, fruit, and vegetables, with cultivation. Every fruit, cereal, and vegetable known to the temperate zone will flourish and prosper here, and yield abundantly in response to proper care and cultivation.

The yield of winter wheat is from 25 to 40 bushels per acre, and of spring wheat, from 25 to 35 bushels. Oats yield from 30 to 50 bushels; barley, from 40 to 55 bushels. The area of wheat is very large and there is never a failure.

The seasons of farm labor are as follows, usually: Spring sowing and planting from March to May; haying begins with clover about June 20th; harvesting commences about July 10th; hop picking begins from the first to the sixth of September, and about the same time the gathering of prunes for drying purposes begins. Summer fallowing is done as early as possible, and fall and winter seeding is done as soon as the fall rains properly prepare the ground to admit of it.

Hay and oats, indispensable products in an agricultural country, are produced in Marion county in excess of the demand for home consumption. The output of hay the past season has been estimated at 25,000 tons, and oats at 900,000 bushels. Other products that have place among the commercial commodities of the country are the potato and onion. Potatoes grow to a large size here and the yield for 1897 has been estimated at 600,000 bushels. A great variety of vegetables grow in this county, and some are of prodigious size.

The value of the surplus cultivated products of the county for the past year has been estimated at $1,500,000. The population of the county as shown by the last census is 30,-947, making the resultant per capita income for every man, woman, and child in the county $50 approximately. And this does not include the lumber product.

The climate is equable and pleasant, never reaching the extremes of heat or cold, and there being very few days in any year on which work out doors is precluded. Very little snow falls in the valley, and the rainfall, which comes entirely in the late fall, winter, and spring, is just enough to insure good crops (of which there has never been a failure in the valley), and is not much different from other points of the United States. There is no rain during July, August, and the first half of September, thus giving the farmers full opportunity for saving their hay and grain crops, and usually their hops, without damage or discomfort.

The hills and valleys of Marion county are adapted to stock raising, and here more attention is paid to quality than number. That farmers and stock raisers are breeding up their stock is evident from the exhibits annually made at the state fair at Salem. The horses, hogs, cattle, and sheep will compare favorably in breed with stock of the Eastern states. The number of hogs the past year has been estimated at 21,000, horses 11,000, sheep 30,000, and cattle 24,000. The wool saved the past year was approximately, 100,000 pounds. In uncleared sections Angora goats are raised with profit.

The timber supply of Oregon, mainly in the western portion of the state, is among the finest in the world. The timber of Marion county is found on the foothills and slopes of the Cascade mountains, where tall firs 7 feet and more in diameter, rear their topmost branches hundreds of feet in the air. There are unnumbered millions of feet of the best lumber on earth standing in Marion county, only awaiting the advent of the developer. The chief varieties of timber grown here for economic and commercial purposes are: Douglas or Oregon pine, yellow fir, black spruce, hemlock, white pine, sugar pine, yew, yellow cyprus, broad leaved maple, myrtle or laurel, dogwood, arbutus, aspen or cottonwood. The Douglas pine or red fir (by which name it is best known), attains a height of 200 to 300 feet, is straight, and is the red hickory of America. French and English experts have proclaimed that for ship masts and spars, "We have tested all the woods of the world and find the red fir the best." The lumber interests of Oregon will always continue to be of vast proportions and a source of great wealth to its people.

The garden spot of the world for the cultivation of hops is the Willamette valley, and the city of Salem sits in the center of the greatest hop district in the world. Every year the large hop dealers of London and the Eastern cities have their representatives occupying offices in Salem, and the money for an average of 75,000 bales passes through the banks of this city. Each bale contains an average of 200 pounds, and at 10 cents per pound the total price of those hops amounts to $1,500,000. The whole crop of 1897 more than averaged 10 cents. Notwithstanding the numerous shipping points by rail and river throughout the hop district, there were shipped from Salem at the close of the selling season over 20,000 bales, or more than 235 car loads, or nearly 12 trains of 20 cars each. The industrious, careful hop grower has been very successful, as the prime article produced here is the best hop in the world and commands the top price. They grow on either bottom or upland, the former giving the heaviest yield, but the latter the cleanest article. A large number of people, embracing whole families, make good wages every fall picking hops. It makes a pleasant camping out period of three or four weeks, and contact with the hops is claimed to be conducive to good health.

Extensive experiments made during the past two years have demonstrated beyond peradventure that in every direction from Salem is found a soil admirably adapted to flax culture, and several experts from Ireland, Scotland, Germany, Belgium, and Sweden have pronounced the fiber as good as the best grown in the world, and capable of being worked into the finest fabrics of the linen family. All the upland prairies, which extend for miles in every direction from Salem, have excellent soil for flax. The lands suitable for flax culture are now to be had at very reasonable figures. Hemp can also be grown at a profit here, as has been proven by experiments made during the present season.

Marion county has charms for the sportsman. The valleys and the foothills abound with the Mongolian pheasant. So well do these birds thrive here that raising and selling them has been found to be a profitable business. The mountain streams teem with trout, and deer and bear are found in the mountains.

Supplied as the Willamette valley is with the purest of water from the mountain streams and springs, in which the country abounds, fanned by the invigorating breezes from the ocean and from the snow-clad peaks, it would be strange, indeed, if this were other than a healthy country. But all theories are laid aside and statistics are taken as a basis of assurance. Taking the United States census of 1890, the average death rate throughout the whole country for the census year is found to be 13.9 to the 1,000, while in Oregon the death rate was only 8.2 to the 1,000. This record places Oregon at the head of all states for good health and longevity.

The climate of this part of the Willamette valley is 11° cooler in summer, and 11° warmer during the winter months than New York City, although New York is more than 5° of latitude further south. The thermometer seldom gets above 90° in the summer, or lower than 10° below the freezing point in winter. It has been to zero but once in the past 10 years. There are no lightning storms, no blizzards, or danger of any kind from the elements.

Salem — the orchard city, the city of schools and churches, the capital of Oregon, the county-seat of Marion county, and the metropolis of the great central valley of the Willamette — is situated on the Willamette river, which is navigable to this point the year round, and for many miles south a good portion of the year. It is a well-built city, the second in size in the state, and contains about 18,000 inhabitants. The greater number of its streets are 100 feet wide, lined with beautiful shade trees, and it is in every respect a model home city.

It has 17 churches, one of which cost $50,000, and all of which are well attended. It has Willamette University, the oldest Protestant institution of learning on the coast. It has a young ladies' academy, a fine brick structure, in which there is always a large attendance; it has 7 public school buildings, one of which cost $40,000, three of them $12,000 each, the others smaller, but commodious, comfortable, and well-filled with pupils. There is also a first-class business college, which commands a large attendance constantly, and in still another commodious building is conducted a private preparatory school, so that the educational interests of the people are well attended to.

It has the finest court house in the state, costing $182,000.

The state capitol, costing $600,000, is located here, as are also the state insane asylum, containing 1,120 patients and 140 employés; the penitentiary, with 350 inmates and 40 employés; the reform school with over 100 boys, and as many more out on parole, and nearly 20 employés; the deaf mute school, the school for the blind, the orphans' home, the state fair grounds and the state fair permanently established here, the United States Indian training school, with 354 pupils, the fourth largest school in the United States. The consuming requirements of these institutions are of no mean consideration to the farmer of this section.

There was completed in 1895 a city hall that would be a credit to a city of 30,000 inhabitants. It cost nearly $60,000, and is of beautiful architectural design, commodious, and convenient. Besides the usual city offices and jail, the paid fire department is also comfortably housed there, with all its paraphernalia.

Salem is connected with Polk county by a free bridge across the Willamette river which cost $84,000, and is high enough to admit the passage of all steamboats under it at all boating stages of the river.

An excellent system of sewerage drains the city; a splendid water works plant supplies the most distant portions of the city with good water; 12½ miles of electric street railway gives every opportunity for ease, comfort, and rapidity in passing from one part of the city to another and to the public institutions in the suburbs.

The Willamette river and the Southern Pacific railway furnish the best shipping facilities, the one being a check upon the other as to freight rates, and in our trade with San Francisco the Oregon Central and Eastern railway, which is built from Yaquina bay eastward through Corvallis and Albany to the Cascade mountains, and which has boats on the river and steamers from the bay to San Francisco, forms a rival line to the Southern Pacific and has been of vast benefit.

The capital city has several manufacturing enterprises of which her people feel proud. Chief among these is the Thomas Kay Woolen Mill, which employs 100 hands and runs night and day constantly. The value of the plant is fully $100,000, and there is worked up an average of 700,000 pounds of wool annually, nearly all of which is grown in Oregon, thus creating a home market for the raw product, furnishing labor to many families who are consumers of the farmers' crops, and making a home article of goods for home wear.

Salem has also a large flouring mill with a capacity of 400 barrels per day, whose product is shipped quite extensively to the Hawaiian islands, China, and Japan; a lumber mill with a capacity of 40,000 feet per day; two sash and door factories; two iron foundries; a cider, vinegar, and preserve factory; two soda water factories; a brewery; two ice manufactories; two wagon and carriage factories; a marble works; two manufactories of fruit driers; a fruit cannery and evaporator; a brick and tile factory; a soap factory; a clothing factory; a shoe factory, and numerous other industries of a limited character.

Salem needs more factories, and they would prosper here. She ought to have a starch factory. Potatoes and other materials suitable for the manufacture of starch can be grown here to perfection, and at as little cost as anywhere in the world, and there is no reason on earth why the shelves of our grocery merchants should be filled with the manufactures of Eastern states. We need a sugar factory. Beets of the finest quality are raised here in abundance, and no better opportunity exists than right here for success in that particular line. We need a tannery and a shoe factory combined. Experiments made in tanning here established the fact that there is no place in the nation where a finer article of leather can be made. The cause of the superiority of the article tanned here is not fully known, but it is supposed to be the character of the water.

We need a box factory. The timber supply suitable for all kinds of boxes is plentiful and easily obtained, while the demand for boxes is unlimited.

Marion county has several good towns, among which may be mentioned Woodburn, Gervais, Silverton, Jefferson and Stayton, each boasting a weekly newspaper, flouring mills, warehouses and minor industries. Brooks, Hubbard, Aurora, Scotts Mills, Butteville, Champoeg, St. Paul, Turner, Aumsville, Sublimity, Marion, Mt. Angel and Mehama are also lively villages, but less pretentious than the other towns named, though all possessing many advantages of schools, etc.

POLK COUNTY.

By Dan P. Stouffer, by the authority of the county court.

Realizing that it will be impossible to give anything like an adequately complete description of the resources and capabilities of Polk county in the limited space allotted to us, all descriptions will of necessity be brief, and an attempt will only be made to give the most salient features of its present condition and its future possibilities. Situate, as it is, in the very heart of the great Willamette valley, its climatic conditions, of course, necessarily correspond in the main with the general description of the climate of the whole valley. The average temperature, for the season indicated, taken from observations covering a period of 20 years, is as follows: Spring, 50·2°; summer, 62·9°; autumn, 50°; winter, 38·8°, with a mean annual temperature of 50·9°. The average annual precipitation in inches, covering the same period, is: Spring, 9·87; summer, 2·30; autumn, 10·56; winter, 17·41, with an average annual precipitation of 40·70 inches.

The county is about 25 miles in width from north to south, lying between Yamhill and Benton counties, and extends from the Willamette river, its eastern boundary, 36 miles westward to the summit of the Coast range mountains, and contains, roughly estimated, 750 square miles. Its physical features, in common with other Willamette valley counties, are widely varied. Along the Willamette river, extending from the middle of the county northward, now receding from, now approaching the river, are the Eola hills, in some places rising to commanding heights, but nowhere too abrupt for cultivation. The remainder of the surface is rolling prairie, except along the western boundary, where the Coast range mountains rear their timbered heights between the valley and the mighty Pacific, 20 miles away. Through the many low gaps in these mountains blows the invigorating and healthful sea breezes, moisture-laden from the temperate waters of the Japan current, tempering with their balmy breath the heat of summer and mitigating the frigid atmosphere of winter. The mountains, and land too abrupt for plowing, comprise, roughly estimated, one-fourth the area of the county. While at intervals, across what we have termed the valley, extend low ranges of hillocks—root like off-shoots from the mountains and foothills—which, first ascending in moderate elevations, then gradually receding in wavy undulations, seem to have come for no other purpose than to vary the monotony of a too dead-level, and to furnish a pleasing variety to the landscape, as well as afford the country an admirable system of natural drainage. The soil is of three general classes, according to location. Along the water courses it is a sandy alluvial deposit of decomposed vegetables, mold, and earth. It is exceedingly fertile, and peculiarly adapted to hop and potato culture, to which uses much of it is put. It will also grow anything else in the vegetable line that will grow anywhere under the sun in the temperate zone, and its richness seems to be inexhaustible. Fifty years of continuous cultivation has caused no appreciable diminution of its productivity. The soil of the valley proper, which comprises, say two thirds of the area of the county, is a rich black loam overlying a clay subsoil. It is proverbially fertile, and will produce in the greatest profusion all kinds of grain, fruits, and vegetables without irrigation or fertilization. The soil of the hills is a red or brown loam, and, while it will produce any of the grains and vegetables grown in the valley, it is peculiarly adapted to fruit culture. Many of the largest and most productive orchards are on the hills.

The soil of the mountains is either a red or black loam, the black usually predominating, and is all, except in a few rocky instances, very fertile, as the almost illimitable forests grandly testify. While some of it is too abrupt and broken for plowing, when cleared of timber it produces an unlimited quantity of magnificent perennial pasture grasses, and even when left alone, after being cleared, it produces an immense growth of wild peas and clover, and forms, with its abundant living water, an ideal range for cattle and sheep.

Polk county is as yet largely an agricultural county. Wheat is "king," and is the crop relied on by the farmer to pay debts and improve the farm. Our markets for this staple are as wide as the world, and our prices are the world's prices. The crop has never been known to fail, and the yield is from 20 to 35 bushels per acre, taking one year with another. And the same land farmed continuously for 45 years yielded last year 30 bushels per acre without fertilization.

Oats, barley, and rye are also grown in sufficient quantities for home consumption, but are not raised as extensively as they would be were it not for the limited market.

Our cool, moist nights in summer, caused by our proximity to the ocean, while they furnish ideal conditions for sleeping, are a little unfavorable to the highest development of corn as a field crop, although every farmer may grow enough for his own use, and it is lately being more widely cultivated with considerable success.

Grasses of all kinds do well, but timothy is chiefly relied on as the hay crop, and rye grass is used principally for pasture. Clover, although heretofore little grown, is being more widely introduced and will doubtless in the near future, form a staple crop.

The principal fruits are apples, pears, plums, prunes, and cherries. These all grow in the greatest profusion, and Polk county will never deprive the state of Oregon of her well deserved reputation as "the land of the big red apples." Peaches are not so successfully grown as the other fruits, except in favored localities along the river bottoms.

Prune-growing and curing has made rapid strides in the last few years and is now one of the leading industries in some localities, and it promises to be the means of breaking up our large farms into smaller tracts and inaugurating an era of more diversified farming.

To enumerate the garden vegetables grown, would be simply to quote some mammoth seed catalogue entire. What is not grown or will not grow has never been discovered in the temperate zone. Potatoes yield as a field crop from 100 to 300 bushels per acre. Beets from 15 to 25 tons, carrots from 10 to 15 tons.

This county is also full to the fore in hop culture. Polk county hops are known and specially quoted in the New York and London markets, and are usually a ready sale when other hops go begging. The yield runs from 1,000 to 2,500 pounds per acre. The average being not far from 1,500 pounds.

While no purely grain producing country can raise stock extensively, yet every farmer keeps a reasonable amount of live stock. Sheep do remarkably well. The mild, open winters enable them to roam the pasture lands at will the entire year, and they produce a good crop of wool with comparatively no attention.

Hogs are not troubled with any diseases, and if left to roam the hill lands will multiply until they become a nuisance.

What has been said of sheep as regards attention is equally true of horses, cattle, goats, and all kinds of live stock. But while stock will do well on good pasture land without feeding or sheltering in the winter, they will, here as elsewhere, respond more liberally to care and attention. Cattle and sheep do well in the mountains in the summer on the natural pasturage.

Dairying is not engaged in as a commercial enterprise. Natural conditions are favorable, and attention to details would make it a profitable industry.

The timber resources of the county are immense. The Coast range mountains are covered with towering giants of fir, cedar, pine, tamarack, larch, spruce, hemlock, and laural. Specimens of these monstrous trees are only excelled in size by the mammoth redwoods of the Sierra Nevadas. Trees 300 feet in height, 9 feet in diameter, straight as an arrow, and 200 feet to the lowest limb, are not unknown.

The foothills, and portions of the valley, are covered with grub oak, and this class of land may be bought very cheap, although very fertile. And it may be cheaply reduced to cultivation by slashing the timber and shrubbing off the sprouts as they appear with goats. The lands along the water courses, where they have not been cleared, are covered with ash, maple, alder, balm, and yew. These are all valuable timbers for many purposes. Immense quantities of balm (cottonwood) are used in the manufacture of paper pulp.

While, as said above, Polk county is as yet mainly an agricultural county, we are not entirely without manufacturing enterprises. Although these are, as might be expected, chiefly such as work up the raw materials into their simplest manufactured products. Let us enumerate a few. We have 13 saw mills, situate along the foothills and mountains; 6 flouring mills, situate along the water courses; 1 three-set woolen mill at Dallas; 3 brick and tile factories; 1 tannery; 2 sash, door, and blind factories; 1 foundry and machine shop; and 23 fruit evaporators.

As regards water power, the county is traversed by 5 mountain streams of various sizes. the Yamhill river, Mill creek, Salt creek, La Creole, and Luckiamute. These streams, issuing as they do from the mountains and foothills, furnish magnificent water power, only at present partially utilized, for many manufactories.

As to transportation facilities, the Willamette river runs along the eastern boundary, and numerous boats furnish cheap fares and freights. The Southern Pacific railroad has two lines of road across the county at various distances apart. Thus bringing the entire county within reasonable distance of some good transportation line. Competition with the railroad by boats on the river tends to prevent exhorbitant freight charges.

The educational facilities of this county are excelled nowhere in the state outside of the larger cities. The State Normal School is located at Monmouth, the La Creole Academy at Dallas, and the several high school courses are maintained in other places. While every highway, by-way, foot-log, and cow-trail in the whole county, leads to the open door of a free public school, and in every village, hamlet, and crossroads one or more church spires point upward.

As we have not the space to describe all the thriving towns and villages in the county, let a brief description of Dallas, the county-seat, in a measure, answer for all. The general conditions, as regards orderly society, school and church facilities, and mercantile and productive enterprises, with slight variations, will be found substantially the same in each of them.

Dallas, a thriving little city of about 1,200 prosperous and happy people, is located at almost the geographical center of the county, cosily nestled on the south bank of the beautiful La Creole, a magnificent stream of pure, cold, sparkling water issuing from the embracing arms of the Coast mountains, only a few short miles to the west. Its location, so close to the pure air of the mountains, renders it an exceptionally healthful place of residence.

All the industries and activities of life usually found in places of this size are represented. Its chief manufacturing and productive enterprises are as follows: One three-set woolen mill, operated day and night, turning out products for the Pacific States, and Alaska trade; one flouring mill, turning out flour for home consumption, and for the China and Japan trade; one large, finely equipped sawmill in town, and one just west of town; one combined planing mill, sash, door, and blind factory; one well-equipped machine shop and foundry, with two cupolas; one tannery; one brick and tile plant; one electric light plant, arc and incandescent circuits; five fruit evaporators; four blacksmith shops; four wagon and carriage shops; one clothing factory; besides shoe shops, tailor shops, and such like.

The educational facilities of Dallas are excellent. A free public school of eight grades, and the La Creole academy, with a three-year course, furnish an unbroken progression from the primary grade to the first year in college. There are 7 church organizations, all but two of them housed in beautiful and commodious edifices. And the work of the churches is ably supplemented by 14 fraternal and beneficiary organizations. Merchandising and trading are represented by 8 general stores, 2 drug stores, 2 hardware stores, 1 shoe store, and 1 jewelry store, besides the usual number of smaller establishments. Doctors, lawyers, abstractors, loan agents, brokers, and insurance men we have in abundance. The Dallas City Bank furnishes banking facilities to meet the wants of its customers. The streets of the city are lighted with arc lamps, and incandescents are used in the business houses and dwellings. We have no water system, and anyone having a reasonable amount of capital would find this a desirable location.

Mails arrive and depart in all directions 10 times daily, and communication is kept up with the outside world by the Southern Pacific railroad to Portland and up the valley; by motor line to Independence on the Willamette river; by stage line to Derry on the other line of the Southern Pacific, and by stage line to Salem, the capital of the state, 14 miles to the east of us.

We can only take space to mention a few of the other prosperous towns in the county in which the same general conditions exist, proportionate to their size and location. Independence, in the eastern part of the county, on the Willamette river, has a population of about 1,400 and is a large shipping point. Monmouth, of 800 inhabitants, the home of the Normal School; Falls City, 350, and many smaller ones—all with schools, churches, postoffices, and shipping facilities.

After the foregoing brief description of the county we will present the following information, for the busy reader, in tabular form:

Population of the county		
Number of acres in cultivation		116,545
Number of acres fit for cultivation, but not cultivated		232,456
Number of acres unfit for cultivation, about		100 000
Average price of cultivated land, about	$	22 50
Average price of uncultivated land, about	$	5 00
Total taxable value of property, 1897	$	4,468,601 00
The following are estimated:—		
Bushels of wheat, 1897		1,467,320
Bushels of oats		630,507
Bushels of barley and rye		23,985
Tons of hay		20,837
Bushels of corn		2,500
Bushels of flax seed		1,200
Pounds of butter and cheese		182,955
Pounds of tobacco		500
Pounds of dried prunes		1,200,000
Pounds of hops		3,600,000
Bushels of potatoes		245,600
Bushels of apples and pears		165,400

Bushels of prunes and plums	97,350
Feet of lumber	7,415,879
Pounds of wool	195,112
Number of sheep	31,015
Number of hogs	11,040
Number of horses	5,362
Number of mules	125
Number of cattle	6,749
Number of goats	3,275

We have attempted, in the foregoing, to give the reader a fair and candid idea of Polk county as he will find it if he should come here. And in conclusion, we will say: This county has never yet failed to amply reward industry and frugality. And anyone coming here with a firm determination to work laboriously, and live frugally for a few years, may be reasonably certain of gaining a foothold, and making for himself a comfortable home, and eventally obtaining a competence for old age. But on the other hand, if you come with the expectation of living by your wits you will be woefully disappointed. The people of Polk county are for the most part descendants of the sturdy pioneers, the pick of the East, who had the nerve and stamina to cross the plains before the era of railroads and palace cars. And a glance at the last government educational statistics, which places Oregon fourth on the list of the states, as regards illiteracy, will convince the most unobservant that these descendants are able to look out for themselves.

And while we desire, and stand ready to welcome and assist any and all steady, sober, and industrious people who wish to come and help us develop our county, we do not want idlers.

And now to those who may determine to come and enjoy the privileges and advantages of our glorious climate, cheap lands, and undeveloped resources, let us say: There are no open valley farms all under fence, with stone buildings on them, lying around loose waiting for you. They were all taken up long ago. So unless you have money to buy an improved farm, or are willing to begin at the bottom and work your way up, as you would anywhere else, you would better stay where you are.

LINCOLN COUNTY.

By J. O. Stearns, County Judge, Toledo.

Lincoln, the youngest county in the state, created by the legislative assembly of 1893, lies on the sunset slope of the Coast range; is bounded on the north by Tillamook, the east by Polk and Benton, the south by Lane, and on the west by the Pacific ocean. It is 52 miles long from north to south, averages from 20 to 30 miles in width, has an area of 1,440 square miles, and a population of about 3,500.

Assessed valuation of 1897	$ 831,759
Number of sheep	4,516
Number of cattle	2,172
Number of horses	370
Number of hogs	500
Miles of railroad	46.1
Miles of telegraph and telephone	59.1
Number of acres in cultivation	4,357

The general character of the country is hilly, cut by numerous streams and gulches, with fertile bottom lands lying along the water courses. Elevation is from sea level to an altitude of about 3,500 feet.

The principal water courses are the Yaquina, Siletz, and Alsea rivers, at the mouth of each of which are bays of sufficient capacity to admit the safe and easy passage of such vessels as are generally used for the coasting trade of Northern California, Oregon, and Washington. Of the three, Yaquina is the largest and the most important from a commercial standpoint. It is situated nearly midway of the county from north to south, coast-wise; is the western terminus of the Corvallis and Eastern railroad; has regular communication with San Francisco and way ports, and is the only bay within the county which has been granted government aid in the improvement of its harbor and deepening of the channel across the bar. About $650,000 has heretofore been appropriated and expended on this important project, the depth of water on the bar having been increased from 7 to 14 feet, according to surveys made by the engineers in charge of this work. A further appropriation of $1,000,000 has been made for its completion under the continuing contract system, specifications for bids are being drafted, and active operations thereunder will probably be commenced not later than the month of May or June of the present year. The work will be speedily prosecuted, and it is estimated, when finished, will give a depth of 19 feet over the bar at mean low tide, insuring to this port rank among the foremost of the northwest coast.

Active preparations are also being made for the construction of the Corvallis and Eastern railroad into the grain-producing regions east of the Cascade mountains, and eventually to a transcontinental connection with other lines, thus placing the commercial interests of Lincoln county in close touch with the marts of the world, insuring prosperity and stability to its various enterprises, and thorough development of its manifold resources.

Along the bays, rivers, and estuaries are many thousand acres of rich tide and bottom lands, the greater portion of which, and especially of the tide lands, have heretofore been used principally for grazing purposes.

In the vicinity of Toledo, the county seat, considerable dyking has been done during the past few years, and these tide lands are now being brought into cultivation, with results most gratifying and profitable to the pioneers of that work in Lincoln county. Grasses, grains, and vegetables yield in prolific quantities and of the finest quality. What has been accomplished in this section is but an example of what can and will be done in other portions of the county as soon as the population, with its increased home consumption, will justify the expense incident to work of that character. That day is not far distant, and Lincoln county, with its superior advantages, will take front rank in the coast counties of the state.

The streams above tide water are pure, limpid mountain torrents, abounding with fish of the finest character, and furnishing ample and inexpensive power for such manufacturing industries as may be inaugurated within its borders.

The entire county was at one time heavily timbered with magnificent forests of red and yellow fir, spruce, hemlock, cedar, larch, and pine, but by the great fire which raged over the coast section of the state at a period so early in its history that the date cannot be definitely ascertained, the original growth, with exceptions to be hereinafter noted, was entirely destroyed, nothing remaining to attest its existence but the gnarled and twisted stumps, the fallen, blackened logs, and the naked stems of lofty trees dotting the sides of every hill, glimmering white under the glare of midday sun, or tinged to crimson by the twilight glow. Where once stood the mighty forest, so dense and tall that the other vegetation strove in vain for a peep at the God of day, now flourish deep thickets of salalberry, salmonberry, huckleberry, and giant fern, interlaced with the trailing blackberry and the wild pea, and interspersed with occasional glades of luxuriant grasses.

Alder, wild cherry, crab apple, and willow are fast taking possession of the creek bottoms and lower hillsides, save where restrained by the hand of man, and a second growth of the original forest is in many places assuming the proportions of merchantable timber. On the south side of the Alsea bay and river, and in the northern portions of the county extensive tracts escaped the ravages of the ancient holocaust and henceforth will furnish the crude material for the finest lumber to the export trade. There are but three steam saw mills at present operating within the county, viz.: at Toledo, Yaquina, and at Waldport, on the Alsea bay. The last mentioned being the only one engaged in sawing for the foreign market and running steadily throughout the year.

The Siletz river is a torturous stream which, though rising but about 18 miles from the ocean beach, yet has a length of some 150 miles from source to mouth.

Extensive tracts of rich bottom and beach lands have yet to feel the magic touch of the burrowing plow, and whole mountains of the the finest building stone are said to exist. The Siletz has long been famed for its rich agricultural lands and fine stock ranges. It was formerly embraced within the Siletz Indian reservation, having been thrown open to settlement by the Allotment Act of 1891.

The more open and valuable sections were naturally chosen by the Indians when making their selections, yet much land of choice quality remained for entry under the United States homestead laws, and is being rapidly improved by thrifty settlers who with their families occupy the same.

What has been written in relation to the topography and character of the Siletz land applies equally as well to the districts of the Yaquina and Alsea with their various tributaries, and to the numerous streams of lesser importance which ramify the county in every direction.

For many years it was the popular impression that the higher lands, which had been denuded by the terrible fires of long ago, were unproductive and of but little value, but it is now practically demonstrated that the elements of fertility, which had upbuilded one of the grandest forests of the world, remain unimpaired by the fierce heat and only need the controlling hand of intelligent husbandry to again set their beneficient forces into action and transform the salal-covered hills into rolling fields of life-sustaining vegetation. It is true that the work of clearing and subjugating these lands is an undertaking of no small import, involving years of laborious attention, much patience, and the expenditure of some money. But it must not be forgotten that the conditions here are no worse than once existed in other portions of the United States where populous cities now rear their costly spires to the sky and the smoke from many a factory chimney curls in air.

It was ever the lot of the pioneers of civilization to blaze the trail for the foot of prosperity to tread, and sow the seeds of luxury for posterity to enjoy. Yet this portion of the state is no longer an unbroken wilderness. Thrifty homes are to be found on every side, and deep inroads are being made into the wildness of its native state. The good things of life are the spontaneous outpourings of a most bountiful nature. From the little garden patch comes a profusion ot the choicest vegetables; the orchard bows with weight of fruit; the hillsides abound with wild berries in season; from the lonesome recesses of the forest comes the choicest game; the waters teem with schools of fish, and from the long stretches of bay and ocean beach the luscious clam pokes forth its sinuous neck, a toothsome signal to devouring man. Honey of the finest flavor, and cream that can be eaten with a fork are no uncommon luxuries upon the meanest table in the land, and yet we are sometimes prone to find fault with the effort required to gather that which nature has so bountifully bestowed.

The one lacking feature to the man of small means, or of no means at all, is steady remunerative employment for those who are unfitted or disinclined to agricultural pursuits, but who would furnish a ready market for that now so common to all as virtually to prohibit its conversion into cash.

All this will change with the altered conditions which come with the march of progress; labor will dine off the lap of luxury, and husbandmen will merrily jingle their shekels of gold.

It is estimated that about one half the acreage in the county can be made suitable for cultivation, the remainder being too rough and hilly for anything but range purposes.

The available resources of the county at the present time, are chiefly confined to cattle and sheep raising, dairying, fruit culture and gardening, building stone, lumbering, and fisheries. Honey, chickens, and eggs are also a considerable factor in the export trade, but it would be a difficult matter to compile an accurate estimate of any of the agricultural resources, no one of which is prosecuted with magnitude in any particular locality, but all of which combined make up a very respectable aggregate.

The fishing, lumbering, and stone industries are each of much importance, being steadily prosecuted and capable of vast expansion.

Large quantities of herring, flounders, perch, bass, tom cod, rock cod, kelp, sole, salmon, smelt, etc., are taken from the bays and adjacent waters of the ocean. Crabs, clams, and rock oysters abound in the bays and along the ocean beach. The finest trout are taken in every stream, and many thousand dollars worth of delicious oysters have come from the waters of Yaquina bay.

The annual output of the salmon canneries, one each being located on the Alsea and Siletz bays, will probably average not less than 15,000 cases, while the entire catch from Yaquina, and a large proportion of that from the Alsea, is marketed either in the fresh, smoked, or salted state.

Coasting schooners are constantly engaged in the lumber traffic between Alsea bay and San Francisco; while building stone from the Pioneer quarry is the principal local export from Yaquina.

Gold and platinum are found in the black sands of the ocean beach, and have been mined for many years with varying degrees of success. Gold in veins has lately been discovered in the mountains, a few miles back from the ocean, upon which development work is being prosecuted with encouraging results.

Extensive coal beds are known to exist in that portion of the county lying north of Yaquina and west from the vicinity of Toledo. It has been thoroughly prospected, but capital is wanting for its further development.

Toledo, the seat of government, is a pleasantly located town of 250 inhabitants, situate on the north side of the Yaquina river about 8½ miles easterly in a direct line from Yaquina City, the railroad terminus, but is distant 9 miles by rail and 11 miles by water. The residence portion of the town is located on a sloping hillside facing to the south, while the business portion is on the lowland contiguous to the railway line and depot. Its residents are a thrifty, industrious people, and have during the past year made many notable improvements to the town. Streets have been graded, sidewalks laid, a pier has been constructed for the landing of vessels, many new residences, and several large business buildings have been erected. Besides the county buildings, there is a large hotel, 2 drug stores, 1 furniture store, 4 general merchandise establishments, 1 hardware store, 1 millinery store, a butcher shop, a shoemaker's shop, a jewelry store, 1 saloon, and a sawmill. It is the center of trade for a considerable scope of territory, and largely controls the Indian trade from the reservation. It boasts the only brick depot building in the state, has 2 newspaper and job printing establishments, telegraph and telephone connection with other points, and daily communication by rail with all important cities in the Wilamette valley. Religious denominations are well represented and a large commodious public school building affords ample accomodations for the 100 scholars in attendance. Among the fraternal organizations having lodges here are the Odd Fellows, Daughters of Rebekah, Woodmen of the World, Circle, Macabees, Artisans, and Grand Army of the Republic.

BENTON COUNTY.

By Joseph H. Wilson, Corvallis.

This county is situated between the Coast range summit and Willamette river, being 100 miles south of Portland; is about 20 by 30 miles in extent, and is one of the most compact and prosperous counties in the state. It contains about 9,000 people, who are thrifty and industrious. The eastern half of the county is in a state of cultivation, while receding into the Coast mountains, by gentle elevations, are many fertile valleys all productive of fruits, cereals, and other farm produce. In the agricultural districts good grain and fruit lands sell all the way from $15 to $30 per acre, according to the condition of improvements, and quality of soil. The average price is about $20 per acre, while grazing lands are held at and usually sell for from $5 to $10 per acre. According to the assessment roll for 1897 the gross value of all property in the county is $2,757,958, which by common consent is conceded to be about one half its value.

There are 67,490 acres now under cultivation, and 249,334 acres, owned by individuals, not under cultivation, of which about three fourths is good agricultural land. Only a short time ago, the writer received a commission to authorize the sale of 1,000 acres out of a large estate, for $6 per acre; fully 600 acres of this land ready for the plow, and the remainder good grazing lands. Such tracts are rare, but in Benton county are a number of large estates, from which farms of almost any size that might be desired, can be bought at reasonable rates, and much of this is first-class grain and fruit land. In the western part of the county, among the foothills of the Coast range, are vacant government lands, where homestead settlers, who desire to settle on such lands, can find good homes and lands well adapted to fruit raising and stock range. The entire county is well watered by flowing streams and hardly a quarter section in the whole foothill district could be found which is not penetrated by one or more rivulets or creeks. Along these streams there is usually a considerable amount of bottom, or level land, which produces grain, hay, and vegetables in great abundance.

Agriculture is carried on with profit. The State Agricultural College, which is located in Corvallis, the county seat, has done much towards eliminating the olden-time fashion of simply "tickling the soil" to get a crop The time of "open air" machine sheds is past and gone. The exclusive cultivation of wheat is past. Varied crops are the rule, and the farmer no longer depends on the wheat market exclusively for his living. Cattle and sheep are a part of every farmer's products, and the mildness of the winter climate makes this highly profitable. Cattle and sheep keep fat on the range the year round.

In Benton county several dairies are maintained with profit to the owners; and this is an industry which is always successful here. One creamery turns out a high grade of butter. There are several lumber mills in Benton county of 5,000 to 10,000 feet capacity, and one at Corvallis which saws 30,000 feet per day. These mills have a capacity to supply the local demand, and also the Corvallis mill ships large quantities of hardwood abroad, at good prices. Three large flouring mills, and several smaller ones, grind up a large amount of the wheat raised in the county. The Monroe mills, including the Liverpool mill, ship extensively, while the Benton mill and Corvallis mill, both located at Corvallis, are well known throughout the state. These mills have a combined capacity of near 850 barrels per day, and the Benton and Corvallis mills grind every day in the year, except Sundays and holidays. Self-rising flour is shipped to Alaskan ports extensively by the Benton mills.

Benton county has excellent transportation advantages, competing river lines, and competing railroad lines reach Corvallis, the county seat, and this gives merchants, consumers, and producers many benefits which only active competition bestows.

CORVALLIS, THE COUNTY SEAT.

Corvallis, with a population of about 2,000, is situated at the junction of St. Mary's and the Willamette rivers. It is practically the head of navigation on the Willamette river, and enjoys a daily river and rail service to Portland, having one steamer and three railroad trains out of the city daily, except Sundays. The public buildings attest the thrift and energy of its citizens. A magnificent new court house, which cost, with furnishings, $80,000; city hall, built at an expense of $10,000; public school building, at $20,000; and the agricultural college building, donated by the public spirited citizens of Benton county, at a first cost of $20,000, to which have been added other large and commodious buildings connected with the college, such as experiment station, halls of mechanics, agriculture and dairying, horticulture, etc., and large dormitories for male and female students. All these public improvements go to place Corvallis in the front rank among Willamette valley cities. The city is well supplied with retail establishments, and prices here are on an average with prices throughout the Willamette valley.

Corvallis has superior educational facilities in a public graded school, with an attendance of several hundred pupils nine months in the year; and the agricultural college, which gives a liberal as well as a technical education. Agriculture and the mechanic arts are taught, and the school is well supplied with all necessary equipments and scientific appliances used in the several departments. It is sometimes called the "farmers'" school, but it is also the "mechanics'" school, and all branches of scientific education are taught by competent instructors.

The religious atmosphere of the city is strong, the Catholic church, and the several Christian Protestant denominations have organizations and church buildings, and the Salvation army is also represented in a strong organization. There is a healthy moral tone throughout all the population, and rude or loose conduct is not tolerated. As a desirable place for a home, Corvallis, in its moral, religious, literary, and social life, offers superior inducements. The fraternal and beneficial orders are well represented—Masonic, Independent Order of Odd Fellows, Knights of Pythias, Knights of the Macabees, Ancient Order of United Workmen, Woodman of the World, Grand Army of the Republic, and kindred orders, being well attended and comprising a large membership in the aggregate. The people of Corvallis are in one sense contented, and in another restless. Contented to prosper as sound, well ordered, business methods admit, of prosperity, not any longer countenancing booming tendencies, nor immature development on prospects *in future;* but, restless in confining energy to local interests only, and this is manifested in enterprise by citizens in various directions, where profit is to be had by legitimate investment and business enterprise. The community is well supplied with capital, and investments in sound business enterprises are made according to the demand, without hesitation.

The Willamette valley is not an "Italy," but it is far better, for here no drouth occurs to ruin our crops, nor frosts of any consequence to menace our fruits, but a variety of climatic conditions, producing a perfect summer, autumn, winter, and spring, with bountiful harvests, and perfect health.

LINN COUNTY.

By O. B. Winn, Albany, and A. J. Johnson, Scio.

This county is about 40 miles wide, 70 miles long, and contains 2,400 square miles, or about 1,500,000 acres. The Willamette river forms the western boundary, the Santiam and its north fork, the northern boundary, the summit of the Cascades its eastern boundary, and Lane county its southern boundary. The western part of the county for a distance of 12 to 20 miles east of the Willamette river is level prairie country, having but little timber except along the various streams that rise in the central eastern part. Lying east, and adjacent to this prairie land, there are tracts level in part, and sometimes rolling, which vary from 5 to 15 miles in width, and further east begin the foothills of the Cascades. The foothills at first are low and gently rolling, but on nearing the mountains are higher and precipitous. The eastern part of the county is the western slope of the Cascades, furnishes fine grazing, and vast quantities of timber valuable for lumber. The timber consists of white, yellow, and red fir, cedar, pine, aldar, oak, etc.

The South Santiam river rises in the Cascades and flows westerly and northwesterly, entering with the North Fork about ten miles above its confluence with the Willamette. It divides the county into two nearly equal parts. A large part of the north half is rolling brush land, and the balance bottom and prairie, and table land on the hills and lower mountains. The brush lands of this section are excellent for grain, fruit, and vegetables. It requires labor to clear them, but when in cultivation they are very productive. Much of this northern division is yet unsurveyed. The soil in the settled part is principally sandstone and basaltic, and is fertile. The whole is well watered and drained by numerous small streams. It is especially well adapted to stock raising and dairying.

The south half of the county includes all that part lying south of the South Santiam river. The eastern portion of this is very similar to the eastern portion of the northern half. The western part of this section of the county contains at least four fifths of the population of the entire county and about five sixths of all the taxable property. The belt from the Willamette to the foothills varies from 12 to 25 miles in width, is an open prairie country, and very productive. All kinds of grain, fruit, and vegetables grow well and are extensively cultivated.

Wheat is the staple production. Along the Willamette and Santiam rivers, half a mile or so wide, rich bottom land covered with brush and cottonwood timber, at present but little of it is cultivated, though for fruit and garden purposes no better land can be found. The general character of the soil is a dark loam, containing a large proportion of vegetable mold, rich, friable, easily worked, retains moisture to a wonderful degree, and wears well. There has never been a failure of crops, and the yield has always been most satisfactory.

Throughout the eastern part of the county farm lands of good quality are as cheap, or cheaper, than in any other portion of the state similarly situated with reference to nearness of market and transportation facilities. Prices vary from $5 to $25 per acre, according to the amount of cultivation, and the quality and extent of the improvements. In the other parts of the county farm lands can be bought at from $10 to $75 per acre.

Careful and conservative estimates of the value of the grain produced in Linn county last year are placed at over $1,500,000, a veritable "Klondike" at our doors; our 800,000 pounds of butter made and marketed at remunerative prices. The mildness of the climate, frequent rains, and absence of cold weather, furnish abundant green food and add much to the excellence of the dairy product

The advance in prices of sheep and cattle has been the cause of our stockraisers paying more attention to their flocks and herds, with excellent results therefrom.

The varied character of the land in the limits of Linn county is of such a nature as to .be inviting to the homeseeker, no matter what branch of farming he may choose to follow.

The farmer who best succeeds here as elsewhere is he who always has something to sell, and likewise is seldom found idle. It may be a basket of eggs, a few bushels of fruit, some cured meats, or a calf for the butcher, but after a few years of industrious work such farmers are to be found happy and contented, living in comfortable homes surrounded with evidences of comfort, their children growing up pleased with their lots in life, and not caring to desert the farm and its comforts for the chances of success in the cities. Linn county is fortunate in possessing many such farmers, and the pleasant homes, substantial barns, and other farm buildings, and general air of thrift to be noticed during a drive through this section will confirm the statement.

Under the original Homestead Act each of the early settlers came into possession of 640 acres of land. This amount was more than could be profitably farmed, and but few of these claims but have been subdivided with good resulting therefrom.

The old orchards planted years years' ago are about past bearing, but scores of prune, pear, cherry, and apple orchards show that the fruit industry is a paying one. Thirty-five carloads of choice fruits, comprising prunes, Bartlett pears, plums, cherries, and apples, were shipped to and found ready sale the past season in Chicago, St. Louis, New York, and Philadelphia. The absence of any extremes in temperature seems to allow Linn county fruit to become better flavored than that grown in any other locality At the state fair held in Salem in October, 1897, Linn county easily carried off the honors by having by all odds the finest county exhibit on the grounds, and one of the individual exhibitors was awarded the second prize for best display of agricultural products. The orchardist is sometimes annoyed with the codlin moths, borers, and other pests, but watchful care and spraying will prevent all trouble and put the balance on the right side when the fruit is marketed.

Oregon is often termed "the land of pretty girls and big red apples." The statement is as true as Holy Writ, and in our own favored county we are blessed with the most luscious fruits and charming women.

The wealth of timber forests in the Cascade mountains in the eastern portion of this county is practically inexhaustible, about 20,000,000 feet of lumber being cut during the year just passed. The prospective opening of the Oregon Central and Eastern railroad across the Cascade mountains into Eastern Oregon will give a wonderful impetus to this industry.

Two systems of railroad—the Southern Pacific, with branch lines, and the Oregon Central and Eastern, with the Willamette river navigable for 10 months in the year, assure the producer and the manufacturer of receiving a fair price for products.

Much development and prospecting work is being done on mines and prospects in the mineral sections. The Lawler gold mines, an English syndicate, are making a good showing in their properties, located in the mineral belt in the Cascade mountains. Many other equally good claims are only awaiting capital to open and develop them.

No cold weather, no snow, very little frost, and scarcely a day in the year when work may not be carried on out of doors, offer a great inducement to one who is industrious and wishes to live in comfort and amass a competence. All of Western Oregon is thus blessed with a mild climate, but more especially is this county favored, as the warm currents of air from the broad Pacific come through a gap in the Coast range of mountains and give up a mild and even temperature the whole year round, and is enjoyed and appreciated by every one but the ice man and the plumber. The first often complains because of no market for his wares, and the latter because of no opportunity to mend burst water pipes in the winter season.

Irrigation here is unknown, the cool nights in the summer season, even in the absence of rain, supplying the necessary moisture for the growing crops.

Our people recognize the need of good roads, and a systematic effort is being made in this direction, with every indication of shortly having the best roads in the state.

To the intending homeseeker we would say, if you wish to live easily and comfortably, take the pains to investigate the claims now made that Linn is the banner county of this great Western state.

Linn county sold in the markets of the world for the year 1897—

Article.	*Amount.*	*Value.*
Wheat, bushels	1,200,000	$ 900,000
Oats, bushels	400,000	120,000
Barley and rye, bushels	18,000	9,000
Potatoes, bushels	216,000	64,800
Cattle, head	10,700	160,500
Hogs, head	11,600	87,600
Sheep, head	18,400	36,800
Wool, pounds	300,000	39,000
Hops, pounds	362,000	32,850
Hay, tons	50,000	400,000
Dried fruit, pounds	453,000	18,200
Green fruit, pounds	4,500,000	18,750
Butter and cheese, pounds	800,000	120,000
Poultry, dozens	26,000	52,000
Eggs, dozens	2,000,000	250,000
Lumber, feet	20,000,000	160,000
Total value		$ 2,469,500

Albany, the county seat of Linn county, is situated on the Willamette river, on the junction of the Southern Pacific railroad with the Corvallis and Eastern railroad, in about the center of the beautiful valley of the same name. It is an enterprising and wide awake little city of 6,000 inhabitants in a locality noted for its healthfulness and prosperity. In a region so celebrated for fertility of soil and abundant crops it is but natural that agriculture should be the main stay of our people. Four large warehouses and two mills, with a capacity of 400 barrels of flour per day, are filled each year with grain raised near here.

The Albany creamery has been in operation for 3 years, and has the enviable reputation of producing a grade of butter which commands from three to five cents above the regular market price in the markets of Portland and San Francisco. This creamery is now being run to its utmost capacity, and arrangements are being made to handle the milk of 600 cows.

Manufactures are of late years receiving considerable attention. The Albany Woolen

Mills, employing 100 people, are noted for the excellence of their output, holding its own against the product of other mills in the markets of the world. These mills have large contracts for supplying clothing and blankets for the United States government. Two chair factories employing 50 people, turn out a finished product that finds ready sale against the Eastern manufactured articles. The Albany Brewing Company supplies the demand for malt liquors and sell their brew in large quantities, shipping same as far as Ager, California. Its excellence is unquestioned by connoisseurs. The Albany Cigar Factory find ready sale for 250,000 cigars annually. The Albany Iron Works do a large and extensive business in work in their line; machinery of all kinds, jail work, engines, and structural work for buildings. A tannery has lately been started that bids fair to rank with other manufacturing plants of the county.

The city is supplied with water taken from the Santiam river, 14 miles distant, by means of a canal. The mills and factories are thus supplied with abundant water power from this source.

The electric light company has a splendid plant, and the city is well lighted at a less rate than any other city in the state.

The Willamette river is open for navigation from Portland to Albany, thus in connection with the railroad lines, giving cheap and convenient modes of transportation.

The Albany College, an educational institution, instituted in 1866, employs a competent staff of instructors, under the presidency of Professor Wallace Howe Lee, second to none.

The public school system is excellent, the district maintaining two splendid buildings, with twenty teachers and superintendent.

The high moral tone of the place is shown by the statement that 15 religious organizations have houses of worship.

A splendid fire department (volunteer), equipped with two steam fire engines, one hook and ladder truck, and one chemical engine, has always prevented the fire fiend from consuming the city's property in any general conflagration.

The banks, hotels, and business houses in general are well equipped for handling the business of the gem city of the Willamette valley.

The town supports two daily, one tri-weekly, and four weekly newspapers.

Lebanon is located 13 miles southeast of Albany, with which it is connected by a branch of the Southern Pacific railroad. It is surrounded by a rich agricultural country, under a high state of cultivation. To the east of the town are the Cascade mountains, whose foothills furnish excellent grazing lands, and the mountain slopes large quantities of excellent timber. The population is 1,200. It supports first-class public schools and the Santiam academy, an excellent school under the management of the M. E. church, and 5 churches. The town is supplied with an electric light plant, 1 bank, flouring mill of 100 barrel capacity, good water power obtained from South Santiam river by means of a canal, 2 planing mills, machine shop, excelsior factory, and a large paper mill, built at a cost of $100,000, which employs 30 hands, and has a capacity of 6 tons of paper daily. Its payroll to employés, and to the farmers for straw, is $3,000 per month.

Brownsville is situated in the southern part of the county, about 20 miles from Albany, on the Calapooia creek where it enters the valley, is a flourishing town of 1,000 people. The surrounding country is a fine grain growing section, and the town site is beautiful. As early as 1853 a woolen mill was built here; it was burned down but was immediately rebuilt, and today is doing a flourishing and profitable manufacturing business. It employs a large number of people and expends large sums annually for wool. It supports good public schools, contains a good flouring mill, planing mill, bank, and the necessary business houses demanded by the population of the town and of the surrounding country. The Southern Pacific railroad passes through the town.

Scio is situated in the northeastern part of the county in the midst of a fine agricultural and stock growing section. It has a population of 550, has one of the finest public school buildings in the county, built in 1895, and 2 churches. Five denominations are represented. Has 1 bank, established in 1890. All lines of business incident to such a community are fairly well represented. A planing mill, a flouring mill of 125 barrel capacity, being one of the best mills in the state. The old mill was burned in 1891; the present one was built and finished with the latest and best machinery throughout in 1892. Run by water power, as is also the electric light plant and water plant which belong to the city, supplying light to its citizens, no doubt cheaper than is done in any other city in Oregon. There is a creamery whose production took the first premium at the Oregon state fair in 1897. The flour from the Scio roller mills took the first premium at the same fair. This is an exceedingly good business point, having a large country tributary to it. The Southern Pacific railroad and Oregon Central and Eastern railroad run within 1½ and 2 miles respectively, of the town, with which they are connected by a branch for freight purposes.

Waterloo is located on the south bank of the South Santiam river, is a thriving little town, having an excellent water power, and where, until recently, were located the Waterloo Woolen Mills, a branch of the Thomas Kay Woolen Mill of Salem, Oregon. This mill was lately destroyed by fire. It expended large sums of money annually for wool, and in the payment of employés. The prospects are favorable for the rebuilding of the same during this summer. It has a population of about 800.

Harrisburg has a population of 700, and is situated on the east bank of the Willamette river, 96 miles south of Portland. It is surrounded by an extended area of the most fertile agricultural land, all in a high state of cultivation. Its elevation is peculiarly advantageous for business and manufacturing purposes. We have easy access to the abundant supply of timber growing on the McKenzie river and its tributaries, which is unsurpassed in its excellence for lumber. Our water power has a head of 17½ feet and the whole Willamette river as a source of supply. It is only partially improved, and is capable of much greater capacity than is at present developed.

We have a saw mill of modern construction, capacity, 40,000 feet per day; a sash and door factory, whose proprietors are contractors and builders, and carry on wagon, furniture, and plow-making.

Nearly all the trades are represented which are necessary to supply the demands of a wealthy farming community. We have three firms engaged in general merchandising; one firm deals in general hardware, farming implements, and stoves and tinware, besides many other business enterprises incident to a thrifty town. One flouring mill and one bank. The city government has been so administered that we have no public debt. We have a commodious city hall, many miles of sidewalks, all in good repair, and a good sewerage system which have been built without a single tax levy. Our public school building is capacious and comfortable. The schools are classified into four departments and reach the ninth grade. They are well managed and are a source of pride. We have two church buildings, erected by public subscription—both well-attended by worshipers of many different denominations. Besides an open river to the sea, we have the advantage of the Southern Pacific railroad for transportation, thus insuring equitable traffic rates for all time to come. To these conditions we invite the attention of home-seekers who are equipped with energy and means to help develop our bountiful resources. To such we promise a hearty welcome, and pledge our best coöperative effort in building prosperous and happy homes, in the improvement of moral and social conditions, and in the fulfillment of what nature has designed our beloved state to be—perhaps the most favored spot on the face of the globe.*

Halsey, Shedd, Sodaville, with its mineral springs and college, a favorable health resort, Tangent, Crawfordsville, Sweet Home, Tallman, Jordan, Lyons, Shelburne, Crabtree, Spicer, Kingston, Oakville, and Peoria are towns of importance, demanded by the country surrounding them, all thrifty and growing.

*NOTE.—The foregoing sketch of Harrisburg was furnished by Hon. James McDonald, mayor of Harrisburg.

LANE COUNTY.

By M. Svarverud, of Eugene.

Population	22,000
Acres under cultivation	120,000
Bushels of wheat raised in 1897	784,500
Bushels of oats raised in 1897	650,000
Bushels of barley and rye raised in 1897	25,000
Tons of hay raised in 1897	50,000
Bushels of corn	31,000
Pounds of butter and cheese	520,000
Bushels of flax seed	600
Pounds of tobacco	4,000
Pounds of hops	800,000
Bushels of potatoes	200,000
Bushels of apples	800,000
Bushels of prunes and plums	100,000
Barrels of salmon	1,800
Cases of salmon	800
Kits of salmon	290
Tons of coal	450
Ounces of gold dust	4,000
Feet of lumber	1[illegible],000,000
Pounds of wool	100,000
Number of sheep	25,000
Number of hogs	19,000
Number of horses	7,630
Number of mules	240
Number of cattle	20,000

It is with pleasure that we present a short description of Lane county, and the advantages, resources, and opportunities to those wishing to come among us to locate and make homes. We feel that we present in this, fairly and frankly, our social and physical standing as a community, for such we represent ourselves, wanting readers to know that we are only one part of a large territory known as the Pacific Northwest, and we cordially invite all looking to a trip to this coast for health or for homes to make Eugene and Lane county a visit. Recognizing the fact that our natural resources are but partially developed, and that many of the most important ones are almost wholly untouched, we invite both capital and labor to come among us and aid in the steady progress of this part of our common country, knowing that thousands in more crowded portions of the nation are anxiously looking for a suitable place in which to establish that which is the laudable ambition of every true American—a home.

By reference to the map of Oregon, it will be seen that Lane county occupies a central position on that division of the state known as Western Oregon. It extends from the Pacific ocean eastward a distance of about 150 miles to the summit of the Cascade mountains; has an average breadth of about 50 miles, containing an area of about 7,000 square miles. Of this vast territory about one fourth is valley land, mostly prairie, with very rich soil, producing abundant crops of grain, grass, fruits, and vegetables every year. The other three fourths of the county is mostly hilly, or mountainous.

The hill or table lands bordering the valleys are usually partly covered with timber or brush, most of it being open enough to produce fine pasturage. These table lands are very fertile, and when brought into cultivation produce the most bountiful crops.

The county is abundantly supplied with springs and rivers of pure soft water. The three principal branches of the Willamette river take their rise in the eastern and southern parts of the county, in the Cascade mountains, and after winding in almost every direction for 100 miles or more they finally unite near the center of the county. The

Coast Fork and the Middle Fork form a junction about 5 miles southeast of Eugene, and the McKenzie empties into the main river some 10 miles further north.

Beginning at a point on the summit of a range of low hills about six miles west of Eugene, we invite the reader to a bird's-eye view of the most beautiful landscape upon which the eye of man ever rested, at least such was the opinion of Vice-President Colfax and companions, when they visited this section some 30 years ago. Looking north for a distance of 25 miles, we view a rich level prairie through which flows the Willamette river. Its source may be traced by the groves of balm, maple, fir, and other trees as far as the eye of man can reach. This portion of the county lying west of the river, south of the Linn county line, east of the Coast mountain range, and north of the summit of the hills upon which we stand, contains about 500 square miles, nearly all of which is fine farming land or the most excellent pasture. Much the greater portion of it is under fence, and is dotted over with good residences and divided into farms varying in size from 80 to 2,000 acres each.

This section is traversed by the Oregon and California railroad, now a part of the great Southern Pacific system, which affords daily communication with all other sections of the state north or south of us This section produces vast quantities of wheat, oats, barley, and hay, with thousands of bushels of apples, pears, prunes, plums, cherries, etc., every year. Hops are also largely produced in this section, the cultivation of which has special attention by many of the best farmers in this county, while it also contains some of the most valuable stock ranches. Nearly all the farms are supplied from natural sources with the best of water, but on some windmills are used to raise it from wells, which are easily obtained in any part at a depth of from 12 to 25 feet.

Timber for improvements abound along the rivers and on the foothills, and is readily accessible from every portion of this section, and in quantity sufficient to meet all requirements for many years to come, after which an inexhaustible supply is found on the mountains on the west and east. The population of the portion now under consideration is probably about 5,000, while it is entirely sufficient to sustain ten times that number. The price of land in this section varies from $5 to $50 per acre, depending on the degree of improvement, nearness to market, schools, etc. Persons immigrating to this section with a few thousand, or even a few hundred dollars, can now secure good homes, which in a few years will be worth more than 100% advance on present prices. There are no lands of desirable quality anywhere in this section vacant, or belonging to the government, awaiting preëmptors or homesteaders. All such lands have been taken up long ago, but they are owned in large bodies, and can be cut up into small farms to great advantage both to buyers and sellers.

West of this portion of the county just described, and about 20 miles from Eugene, the hill lands begin. These hills are not high or precipitous, and are mostly covered with dense growth of timber, fir being the leading variety The soil of the hill lands is not so rich as the valley, yet, produces well where it has been cultivated, and furnishes excellent out-range pasture. Many homesteads have been taken up in this section within the last few years, and there are yet others to be taken that will in a few years furnish good homes. Extending west from this section to the ocean is a wilderness of hills and mountains of which little is known, except that it is a densely timbered region, affording protection to wild game, such as deer, bear, elk, etc. The mountains are covered to the summit with forests of fir, cedar, hemlock, etc., the best lumber-producing timber in the state, and the creeks and rivers furnish ready means for bringing them down to the mills below. Several small streams rising in the Coast mountains, and flowing east and north, unite and form the famous Long Tom, which flows northeast and empties into the Willamette river. On the Long Tom are several sawmills which produce ample lumber for local demands at very low rates, say from $6 to $12 per thousand feet. The valley of the Long Tom contains some fine farm and stock ranches. Extending southward from the range of low hills mentioned in the first of this chapter, upon the summit of which we are supposed to stand when viewing the north central portion of the county, is a series of hills and small valleys for a distance of about 25 miles to the summit of the Calapooia mountains, the crest of which range forms the southern boundary of Lane county. These small valleys are very fertile and furnish many excellent homes for the few people who have settled in them. The largest is the upper Siuslaw, which contains many fine farms and good residences. There is also a good sawmill, furnishing lumber for fencing and building purposes. The land in these valleys is mostly taken up, in fact all of the most desirable parts are owned already, and are worth from $5 to $20 per acre, according to location and improvements. Directly south of Eugene, at a distance of four miles, is Spencer Butte, which rises 1,500 feet above the valley. It is the highest peak in a range of hills extending south of the Calapooia mountains, and east of the section described as consisting of numerous little valleys lying about the streams forming the upper Siuslaw. This range of hills forms the water shed between the Siuslaw river and the Coast Fork of the Willamette.

COAST FORK.

The hills and valleys of the Coast Fork will next claim attention, occupying as they do the south central portion of the county. The river rises in the mountains on the south of the county and flows in a northeasterly direction. The valleys along its lower portions for a distance of 25 or 30 miles contain many very fine farms and stock ranches, and some of the finest lands in Western Oregon. The thriving villages of Creswell, Cottage Grove, and Latham are located in this section along the Oregon and California railway, which follows the main branch of the Coast Fork. Several mills furnish this region with lumber very cheap. The east branch of the Coast Fork, known as Row river, is the largest tributary of Coast Fork, and has located near its head the famous Bohemia mines, and has lying along its course many of the most beautiful and fertile valleys in the county, well watered, and surrounded on all sides by the most excellent timber.

At the side of one of these valleys, 30 miles from Eugene, is a natural curiosity a column of solid rock, 50 feet high and as straight as Pompey's pillar, and not more than 6 or 8 feet in diameter.

The Coast Fork country is an important part of Lane county, producing many thousand bushels of grain and hundreds of horses, cattle, sheep, and swine every year. The towns mentioned as lying along the line of the Oregon and California railroad contain good schools, mills, churches, stores, shops, and all the various appliances of modern civilization. Land in this section varies in price according to location and improvement, from $5 to $30 per acre, and it may be safely said that the increase in values in this section will be as great as that of any other part of the county.

The town and precinct of Springfield lies directly east of Eugene, and is the most important and wealthy in the county, comprising the country lying along the McKenzie river for 18 miles above its mouth, and bounded on the west and south by the Willamette river and Middle Fork. It contains a large area of the finest grain and fruit producing land in the county, and is the best improved of any portion. Lands are valued at from $15 to $40 per acre, and some could not be purchased at even somewhat higher figures. But one thing is certain, they will never be less valuable than now. The town of Springfield, three miles east of Eugene, is a flourishing village containing schools, churches, stores, shops, and dwellings, and is the site of the famous Springfield flouring and saw mills, where every year are produced large quantities of the best family flour, and many thousand feet of choice lumber, thoroughly prepared for the builder's use. There are no finer water power in the county than is utilized for this work.

East of this precinct are thousands of acres of mountain lands lying along the McKenzie river. Settlements have been made along the river as far as the Foley hot springs, a distance of 60 miles from Eugene. These springs, also Belknap's, lying in the same region, are considered highly beneficial for many diseases, especially rheumatism, and have been improved by the erection of hotels and bath houses, and will when the other portions of the county become fully populated, be important points for summer resorts.

The valleys along the upper McKenzie and branches are narrow but exceedingly rich, and produce fruits and vegetables of enormous size and excellent quality, not surpassed by any other section of the county. The roads are not good, and access to the country being difficult, the price of lands are low, and a small sum of money would in many places secure good homes. This whole region abounds in fir, hemlock, and cedar timber, from the last of which many thousand shingles are annually made, brought down the valley and sold at about $2 per thousand. Just about the mouth of the McKenzie river, and extending down the Willamette a distance of about 9 miles, and east 6 to 8 miles, is the precinct in which the town of Coburg is situated. It is composed mainly of rich, level prairie and fairly well improved, and is well situated as regards access to mills and markets, being traversed by the Oregonian railroad. Schools and churches are not neglected by the people of this section, and is altogether a very attractive portion of the county. Lands rate from $10 to $25 per acre, dependent upon improvement. Some good lands, unimproved, could be had even lower than these prices.

This completes the circuit of the different sections of the county as a whole, and we may say that investigation will show that of all the counties of Western Oregon, Lane is, probably, the most fortunate in situation, quality of soil, variety of products, the value of natural resources, and salubrity of climate; in area of lands susceptible of cultivation, the largest of its sections; in prices of land the lowest by far when its various comparative advantages are considered. It contains only about 20,000 inhabitants, while the lands of good quality within its borders, when properly divided into small or medium sized holdings and brought under good cultivation, will furnish homes and support for more than ten times that number, and yet its resources not be taxed to anything like the equal of many of the counties of the older states.

A KLONDIKE AT HOME.

The mines of Lane county possess gold in paying quantities, which are located within easy access of the Southern Pacific railroad, and fairly good wagon roads to the mines, with every facility for operation. We shall not undertake to tell you any fabulous tales, but we do undertake to tell you that you can find plenty of gold in good paying quantities in the mining districts of Lane county, which are known as "Bohemia and Blue River." The mining district of the Bohemia, the greater part of which is in the southern portion of Lane county, in the Calapooia mountains, extending from east to west a distance of 20 miles, and from north to south about 10 miles. Over this entire area there are extensive deposits of mineral bearing quartz. Several of the ledges extend nearly through the district in a northwesterly and southeasterly direction. Properties in the Bohemia now quite extensively worked, are the mine owned by the Noonday Mining Company, which has been worked for years, and thousands of dollars in bullion taken out every year with their old five-stamp mill, which was taken into camp about 30 years ago. This company erected last year a new twenty-stamp mill, with all modern improvements, and has it now in operation, working at full capacity, and the gold now taken out shows it to be a rich mine. Next in attention is the Musick mine, located 6 years ago, and which has established the reputation of the Bohemia mining district. It has paid large dividends ever since it came into the hands of its present owners 3 years ago, and has probably returned to them the full amount of their investment every year. The ore is mostly free milling, and averages about $60 to the ton. Since May, 1897, over $30,000 in gold has been taken from the plates of the five-stamp mill, and the company now have on hand 1,000 tons of concentrates waiting opportunity to ship them to a smelter. The Champion mine, lately sold to Joseph F. Woodruff, of Chicago, has a good ten-stamp mill, and in the coming year this property will be fully developed and worked to the full capacity of the mill, which, from the development work already done, proves to be as valuable as any of the former. Next comes the Star mine, with a five-stamp mill. The Johnson and Tremaine mine, with a two-stamp mill, both helping to develop the claims on which they are situated. Messrs. Hart and Alexander, who are just completing a ten-ton mill at the extreme western limit of the district, have apparently an inexhaustible supply of free milling ore that assays about

$7.50 per ton. They have now got their mill about ready for operation. Sheridan and Hamilton, of Roseburg, and I. G. Davidson, a mining operator of Portland, have recently bought valuable claims and are getting ready to erect mills in the early spring. Ziniker and Graber Brothers are erecting buildings and making all preparations to put in a five stamp mill on their property in the near future, and several others who own valuable claims are getting ready for operation. There are many good claims in the district, as yet only slightly developed, that only await capital to make them good paying property, which are owned mostly by prospectors and miners who spend their time in assessment and development work. Many such claims could be purchased, or an interest in them, for a moderate price, and undoubtedly a good source of investment for those who desire to engage in mining could be had by the purchase of these claims, or an interest in them. There is one good wagon road into the mines, and another has been recently surveyed and will be opened in the spring, considerably shortening and improving the route. The present activity points to great developments in the near future.

BLUE RIVER.

The Blue river mines, situated 45 miles east of Eugene, are yet in their infancy and undeveloped state. Yet from the prospecting that has been done, there is every reason to believe, in fact there is no doubt, that there is rich ore in this vicinity and an almost unlimited amount of it, and the time will only demonstrate the fact that the Blue river mines will be second hardly to the great mines in Butte, Montana. As yet there are no mills in working condition at these mines, but upon completion of a wagon road to the mines, which is now finished to the top of Gold Hill, and will be completed to the district this coming spring, several mills will then be put in, when active operation will begin. There are in the neighborhood of 20 locations in this district, all of which are very promising, and have turned out some excellent assays. Good roads to the mines and the necessary capital are all that is necessary to make the Blue river mines in Lane county one of the very important factors in the development of the county and state.

Eugene, the principal city and county seat of Lane county, is a thriving city of about 5,000 inhabitants. It is situated at the head of river navigation of the Willamette river, 123 miles from Portland. The city is the seat of the state university, the leading institution of learning on the North Pacific coast, with an able faculty and a large attendance of students from all sections of the state. This institution has attracted to the city a very desirable class of citizens who wish to educate their children, and the general tone of society is of as high character as any city of the state.

A fine and commodious brick and stone court house, for the use of the county, costing $60,000, and to be completed in 1898, is now in course of construction. A complete system of electric lights is in use by the city and private residences. The city is supplied with water from the butte north of the city, with ample pressure for the most perfect fire protection. We have a most excellent system of public schools. Nine church edifices representing as many Christian denominations. Eugene is located on the main line of the Southern Pacific railway, leading from Portland, Oregon to San Francisco, California.

A pleasant view meets the eye, looking in any direction from the city. The first impression is that this is the center of a grand amphitheater. The level and rolling prairies stretching away in every direction into a broad expanse to where the outer edges meet the mountains rising in their grandeur. Circling from the north to the south on the east is the magnificent Cascade range, and from north to south on the west, the less gigantic but beautiful Coast range, with its natural gateways on the north and south. In this latter range of mountains may be seen Mary's Peak, towering high above the rest, wearing a hood of snow till May or June. In the Cascade range can be seen Mount Jefferson and the Three Sisters, all clad with perennial snows. The Willamette river, where it passes the city, is lined upon the opposite shore with tall balm trees, and looking up or down stream the native fir rises tall, spare, and uniform, silent sentinels, casting their shadows upon the placid waters beneath. Her position is the very center of vast agricultural surroundings. Describe a radius of 20 miles, with one point of the compass in Eugene, and the amount of lands thus circumscribed unfit for cultivation will not exceed one twenty-fifth of the whole area, with the exception of a small segment of this area, possibly one tenth, it is all tributary to Eugene, directly and necessarily. To the south this area can be extended 10 miles farther, and retain nearly the same relations. Tributary to this circle are several streams radiating for miles into the Cascade and Coast range of mountains. To the east of the Willamette are the most notable McKenzie and the Mohawk; to the west, Long Tom, Spencer, Coyote, and the Siuslaw. All these streams flow through fertile valleys containing thousands of acres of rich soil admirably adapted to farming, fruit orchards, and stock raising.

Eugene, unlike most western towns, has never experienced the ups and downs of a forced boom with its demoralizing effects. The growth of the town has been steady and permanent, based upon actual demands, and what is found here can be accounted for upon that basis of existing to supply a present instead of a prospective demand. As a trading point Eugene ranks with the ordinary town twice its size, this being accounted for by nature and extent of its tributary country. The city is well governed and economically administered. Property is comparatively cheap. Taxes very low. We have several factories and manufacturing concerns, and there are openings for the investment of capital in manufacturing. Almost any line of manufacturing that can be followed on the coast can be made perfectly successful here, as power is abundant, raw material and fuel plenty and cheap. There are many elegant residences and grounds, in fact Eugene is known as the "City of Homes."

The summers are usually dry, very little water falling through the months of June, July, and August; only twice in 40 years have the crops been seriously injured by summer rains, while wheat may be sowed 9 months in the year with almost a positive certainty of securing a good crop. There is a light snowfall in this section nearly every winter, as far south as the Shasta regions of Northern California, but a winter with more than two or three weeks snow has occurred but very few times since the settlement of the country, and mercury as low as zero is seldom known. Many stock raisers in the valleys and foothills of this section put up but little, if any, winter feed, as it is very common for cattle to winter in good condition on the natural pasturage of the outrange, though perfect safety from loss would necessitate putting up enough for two months' use.

The ocean breeze which fan this section are sufficiently cool to prevent all exhaustion from heat, and such a thing as sunstroke, or a night so sultry that persons cannot sleep comfortably, is entirely unknown. The equable character and temperature of the climate is manifestly due to the circulation of the air over the Japan current, united with protection given by the mountain ranges; and as these causes are forever fixed in their nature, no such thing as an extreme cold or heat is possible.

As regards healthfulness, we can only say by the reports of the United States government and records, Oregon is shown to have the lowest death rate of any state in the Union. And Lane county is as healthful as any portion of the state, and we can safely say it is as healthful as is possible for any really fertile country to be. An important feature is pure soft water, the use of which is almost certain relief to the dangerous diseases of the liver and kidneys which afflict so many inhabitants of limestone countries.

Winter in Oregon seems to convey but one idea to the average man, not an Oregonian, and that is continuous rain from October till April. Nothing could be more erroneous. Our first rain usually comes in September, but the little moisture that falls during September, October, and November is just enough to keep the air clear, and give during that time the finest fall season to be found anywhere. After December 1st we get rain that is really rain. December, January, February, and March give us three quarters of our annual rainfall, which rarely exceeds 36 inches in toto. These four months are not the same, year after year, but sometimes the one that is wet one year is dry another. For instance, last year, January gave us several heavy rains, and February was very dry, so that our streets were dusty. This year January was dry, and February exceedingly wet. A number of farmers assure us that the ground was never in better condition for plowing than during January, and, consequently, the winter wheat crop sowed was in the best of conditions. The farmers need not stop work on account of the inclement weather during any season of the year. Last November we had one week when the thermometer ranged each night around 22° above zero, but since that time there has not been enough frost to kill the few remaining house flies. We have had violets in bloom all winter. Vegetables, such as cabbage, cauliflower, turnips, carrots, and parsnips remain in the ground till needed.

DOUGLAS COUNTY.

By Hon. D. S. K. Buick, Roseburg.

Douglas county, otherwise known as the Umpqua valley, is the most northerly of the group of counties constituting the district of Southern Oregon, with an area of 4,900 square miles, extending from the summit of the Cascade range westerly, to the Pacific ocean, 140 miles. Climatically, Douglas county is a favored region, warm in winter and cool in summer; average rainfall, 35 inches, yearly, at county seat—sufficient to produce bountiful crops without irrigation. Natural facilities exist on every stream for artificial watering, but seldom utilized. Snow rarely falls in the valleys of the Umpqua, and never remains more than a day or two. Temperature seldom below freezing point in winter, and rarely above 80° in summer, 75° being normal day temperature, nights cool.

General character of valley soil, alluvial, deep and highly productive of cereals, grasses, vegetables, and all kinds of fruits common to temperate zone. The bench and hillsides, where tillable, also carry rich, free soil, highly adapted to fruit culture, evidenced by the thousands of acres in prune, apple, pear, peach, and cherry orchards, that for quantity and quality of fruit are not surpassed by any district on the coast, and constitute a great and profitable industry, increasing yearly in area and profit, as experience develops better methods of drying, packing, and marketing the product. Suitable lands for fruit culture are obtainable in quantities to suit the purchaser, in good localities, from $15 to $25 per acre.

The county contains approximately 2,500,000 acres, of which 150,000 acres are clear, tillable land, left so by nature, not over half of which is in actual cultivation, from the fact that all kinds of farm products have been low for several years, and grain raising unremunerative. The Umpqua valleys and adjacent hills are peculiarly adapted to cattle and sheep raising, in conjunction with other branches of agriculture, from the fact that domestic animals of all kinds, excepting work horses and milch cows, procure their own living outside all winter—a great saving to owners in cost of food and labor. While free wool decimated the flocks during recent years, a revival of the sheep and cattle industries are now apparent.

Tracts of several hundred acres, or several thousand acres in one body, of which a fair proportion would be suitable for grain, grasses, hops, fruit, vegetables, etc., including the sugar beet, and balance for stock purposes, with fair improvements, are obtainable at from $8 to $15 per acre, according to quality, quantity, location, and improvements, while lands only suited for stock purposes can be purchased at from $3 to $5 per acre. The farms are usually well watered by springs, creeks, or running brooks, with a supply of oak or fir timber for firewood. In the early settlement of this county individuals acquired large bodies of the best lands by donation and otherwise, who are now willing to dispose of large or small tracts on fair valuation and terms of payment, affording great opportunity for individuals or colonies to plant "ideal homes" in this "Italy of Oregon." The county has public roads and costly bridges wherever necessary, court house and jail, up to date; poor farm, county fair grounds, flour mills, sawmills, stores, postoffice, school houses, church organizations of every denomination, and benevolent societies firmly established at populous centers, newspapers in several towns, and good society everywhere.

TRANSPORTATION.

The Southern Pacific railroad traverses the county from north to south. The Coos Bay and Roseburg railroad, with 30 miles of road in operation from Coos bay eastward, with prospect of early completion to Roseburg, will reduce present freight charges 50%; will bring the county seat within three hours of tide water; open new markets for surplus product, besides bringing into use thousands of acres of agricultural lands in the western part of the county, now idle for want of railroad transportation, and also open up great forests of timber.

TIMBER RESOURCES.

In the valleys and foothills oak is the prevailing timber, covering greater area than in any other county in the state, and valuable for commercial purposes. Maple, ash, and other hard woods, suitable for furniture and finishing lumber, also exist in large quantities. The Cascade and Coast range are one vast forest of magnificent timber. Every variety of fir, pine, spruce, and cedar common to the coast are represented. Large areas of these timber lands are adjacent to the Umpqua and its tributaries, and logs can be floated to railroad points, or to the ocean outlet at Gardiner. Many water powers of great porportion exist along the line of railroad and their crossings, affording cheap means to turn the logs into commercial lumber, and for other manufacturing purposes.

MINING INTERESTS, MINERALS, AND STONE.

The western slope of the Cascade range, foothills, and streams leading therefrom to the ocean, from northern to southern boundary of the county, are rich in precious metals lodged in the ancient gravel beds and in the rocks that rib every mountain side. Gravel beds have been worked by primitive modes for many years by individual effort, and millions taken out. Only in recent years modern hydraulic machinery has been introduced. On the tributaries many hydraulic mines are in operation, among which may be named that of Durham Brothers and Hinkle, of Portland, on Tennessee gulch, taking out from $15,000 to $20,000 yearly; the Victor, near Glendale, owned by a Chicago company; Frank Kane, at Union creek; J. B. Riddles' "Cracker Jack," and numerous others opened last fall. The output of these companies and others is reported at $50 to $100 per day, per giant, while operating with a full head of water. The Messrs. Day, upon Olalla creek, started up this season with extensive hydraulic machinery for placer mining, and a milling plant for rock crushing and concentrating, costing $70,000 to $80,000. Having purchased large blocks of placer lands, they have brilliant prospects of a paying investment. Many of the heavier gravel deposits and highest channels of the ancient river system crossing this county remain unappropriated for want of capital and enterprise to develop their fabulous wealth. In Myrtle creek district, where placer mining has been carried on in a primative way for 40 years, and considerable money taken out, large and well developed quartz veins have been uncovered, containing gold, silver, and copper in paying quantities. Extensive development work has been done, notably on the "Black Republican" and "Yankee Boy" properties with 20 to 30 foot veins, carrying copper and gold ranging from $30 to $40 per ton. Sufficient work has been done to indicate permanent veins, and the ores are easily reduced. There are others equally promising, and with the introduction of suitable plants will become a great and prosperous mining camp.

Bohemia district, in the northwestern corner of the county, has several stamp mills in Douglas, also in Lane county, that are working in high grade ore, and with additional machinery constantly going into the district must result in Bohemia becoming a large producer of gold, silver, and lead, as soon as the proper plants for their reduction and separation can be placed. Recent completion of wagon roads into the district will enable them to do so during the present year. One cinnabar mine, at Elk Head, northeast of Oakland, is being profitably worked by a small company, having rich ore. The Bonanza and Nonpariel quicksilver mines on Calapooia creek, seven miles east of Oakland, are now preparing to construct new furnaces to work their extensive deposits of rich ore.

Near the Southern Pacific railroad, at Riddle, is the famous "Nickle Mountain," having an area of some 1,500 acres, one mass of nickle silicate ore of a high grade, being only equaled by one other known deposit of nickle in the world, that of New Caledonia, belonging to France. The development of this great industry is held back by the admission of nickle matte into the United States free of duty. There is enough of this valuable commodity at Riddles to supply the nation for ages to come.

MARBLE AND STONE.

Roseburg and vicinity has extensive deposits of varigated marble, that gained a medal at the Chicago World's Exposition in 1893. Also limestone of high grade, and coal deposits cropping out at intervals to the Pacific ocean. Building stone is abundant in many localities throughout the county. Notably, in the vicinity of Wilbur and Oakland, adjacent to the railroad, are extensive beds of sandstone, the texture and color of which compare favorably with any other in the state, by government test. Also hydraulic cement deposits of high grade exists in rock formation in the same vicinity.

WATER POWER.

Surplus water power awaits development in every locality referred too in the foregoing paper. Notably, at Winchester railroad station, a substantial dam has been constructed across the North Umpqua, developing 1,000 horse power at the lowest stage of water. One 250-horse power Lefell wheel in position, and the lovliest site for a manufacturing town lies waiting the advent of capital to utilize and develop it into profitable industries. The crystal waters of the river are teeming with salmon and trout.

Roseburg, with a population of 2,500—being the county seat—is the inland business center of the county, 75 miles on an air line inland. Elevation above sea, 487 feet; a division station of the Southern Pacific railroad, having repair shops and many employés, etc., and intended to be the junction point of the Coos Bay, Roseburg and Eastern railroad, connecting with tide water at Marshfield, on Coos bay. Thirty miles of the road from coast terminus is in operation, and rights of way being secured to cover the last 60 miles, with the view of early completion, making this city, outside of Portland, one of the best railroad points in the state. Two daily passenger trains, running north and south, connecting us with all points on the continent; about 20 freight trains per week passing through the town. This is a distributing point for a large territory, having many general business houses representing every line of merchandise and trade. Also 2 substantial banks; 2 flouring mills, driven by water power; 1 fruit distillery and brewery; 1 brick factory; United States land office, covering many counties in the district; distributing postoffice for latteral routes, stage lines connecting; United States weather bureau.

County and city affairs economically managed, and in good financial condition. The city has electric lights; business portion substantial brick, and protected from fire by a water system having high pressure. All of the best benevolent societies established here, large public and private schools, eight churches to care for the moral welfare of the people, good society and healthful climate. Seldom any snow, and winter temperature generally above the freezing point. One mile from city limits, a soldiers' home has been established, supported by the state and United States, containing nearly 100 veterans of our late civil and Indian wars. One republican and one democratic daily newspaper are published, having power presses; 2 telegraph and 1 telephone offices; Wells, Fargo's express; 1 national and 1 private bank; good hotels; opera house, etc. Company A, O. N. G., is located in the city. City government consists of a mayor and common council.

Other railroad towns and stations in the county north are Winchester, on the bank of the North Umpqua, with unlimited water power, and townsite the best place in the state for a beet sugar factory, a needed industry.

Wilbur, building stone and cement deposits adjacent, fruit and farming lands.

Oakland, a flourishing town substantially built, with three flouring mills, tile factory and brick works, hop yards, prune orchards, grain and stock farms, large business houses, a great shipping depot for agricultural produce of every kind, one house shipping over $7,000 worth of dressed turkeys in one shipment in November, 1897, and $35,000 worth of poultry and eggs for the season of 1897. The shipping point for three quicksilver mines, and the terminus of the Bohemia wagon road.

Yoncalla, with large agricultural and fruit lands.

Drain, with State Normal School, mills, stage route to the coast, large mercantile houses, etc., is an important and growing town.

Hudson is the site of an extensive lumbering industry, shipping much of their product to Eastern states, the output amounting to $25,000 per annum.

Comstock is the center of extensive coal deposits.

Elkton, a stage station on the Umpqua, has a saw mill, flouring mill, extensive salmon and sturgeon fisheries.

Scottsburg, at the head of steamboat navigation on the Umpqua, is an old and thrifty town.

Gardiner, Douglas county's only sea port, at the mouth of the Umpqua (Oregon's second largest river) on Winchester bay, is the seat of large lumbering and shipping business. The Gardiner Mill Company, cut and ship annually, in their own vessels, over 18,000,000 feet of lumber. Their payroll and logging account at the mill alone amounts to $85,000. Captain Reed usually puts up 20,000 cases and 1,000 barrels of salmon; value, $45,000. A creamery and cheese factory with 500 cows do a large business. Grains, fruits, vegetables, eggs, and poultry also amount to a large sum.

Southward is Dillard station with extensive areas of fruit—largely prune, and other fruits, grain, hops, etc.

Myrtle Creek, a thriving village, having flouring, planing mills, and fruit distillery, gold and copper mines, grain and fruit industries of great magnitude, its vicinity being the original home of prune culture in Douglas county.

Riddles, a progressive town, being the center of an extensive grain, fruit, and mining country. The shipping point for Canyonville and the South Umpqua.

Glendale and Galesville, on the Cow creek, are noted as an extensive placer-mining section of country. Canyonville, on the old stage road, and South Umpqua, with flouring and saw mills, does a large business in mining supplies and agricultural produce of every description, being the shipping point for a fertile region of country.

It is impossible in the brief space allowed in this article to enumerate and do justice to the many industries and undeveloped resources of this county. In many cases it is difficult to collate exact facts, and, to give a better idea, will append a short statement of established industries and amount of output, where known to the writer.

INDUSTRIES.

Twelve flouring mills, water power: three steam, and many water power sawmills; one tile and several brick factories; three sash, door, and box factories; many fruit and hop-drying establishments; creamery and cheese factories.

Some commodities shipped in 1897:—

Wheat and flour	$ 210,000
Oats, hay, and potatoes	126,000
Dried prunes, 8,000,000 pounds	100,000
Other varieties dried fruit	10,000
Varieties green fruits	20,000
Poultry and eggs	97,000
Butter and cheese	55,000
Hogs, 12,000	96,000
Cattle, 5,000	90,000
Sheep, 5,500	11,000
Hops, 220,000 pounds	26,500
Wool, 230,000 pounds	29,000
Lumber, 18,000,000 feet	126,000

Salmon, from Umpqua river, Gardiner to Roseburg, inclusive	40,000
Gold, 6,500 ounces	128,500
Total	$1,160,000
Population	17,000
Land in cultivation, acres	83,900
Average price farming land, per acre	$ 12
Assessment roll, 1897	$5,606,757
Number mortgages released from October 1, 1896, to October 1, 1897, 165, amount	$ 137,000

COOS COUNTY.

By J. H. Schroeder, County Judge, Arago.

Coos county is situate on the Pacific ocean, in the southwestern portion of the state of Oregon. Curry county adjoins it on the south, and Douglas county on the north and east. Its area is about 1,500 square miles. Two waterways traverse its domain.

Coos bay, in the northern portion of the county, is the principal harbor. It has a water shed of about 600 square miles, a tidal area of 24 square miles, an average rise of tide of 5 to 6 feet, and a tidal flow through the medium of its principal tributaries of 30 miles inland. Its tributaries are North, South, Willanch, Pony, Coal Bank, Isthmus, and Catching sloughs, and Coos river. The United States government has expended about $750,000 in jetty improvements at the mouth, which are not yet completed. It is estimated that an expenditure of $250,000 more will insure a channel 1,500 feet wide and 20 feet deep at low tide. This improvement and the lighthouse on Coos Heads have been a material aid to the shipping interests. There is now seldom any delay, vessels go and come at all hours of the day and night. A life-saving station is situated near the entrance on the west side of the bay. Coos bay is, next to the Columbia river, the most important and best harbor in the state.

The Coquille river, situate in the southern portion of the county, has a water shed of about 1,000 square miles, including part of Douglas county. A tidal area of about 5 square miles, a rise of tide of 5 to 6 feet, and a tidal flow of 40 miles inland. Its tributaries are the North, South, East, and Middle Forks, and numerous creeks of more or less importance. The government has expended about $160,000 in the construction of jetties at the entrance, which are not yet completed. There is a lighthouse at the entrance, on the north side, which, with the jetty improvements, has been a great benefit. The bar channel at low tide is about 100 feet wide and 10 feet deep.

Over 10,000,000,000 feet of merchantable timber, 450 square miles underlaid with strata or lignite coal, from 3 to 6 feet in thickness, auriferous deposits, a fertile and productive soil, an abundance of pure water, and an equable and healthy climate, are the endowments bequeathed by nature to Coos county.

The Bandon observing station, situated near Bandon, at the mouth of the Coquille river, has the most equable temperature of any of the observing stations in the United States, as is shown by the signal service reports. The temperature in January ranges from 30° to 50°, and in August from 50° to 70°. The mean temperature in 1897 was 52·2°. The difference between the three winter and three summer months was 11°. The rainfall was 44·92 inches. The prevailing wind in summer is from the northwest, and in winter from the southwest, both pure and healthful winds coming direct from the Pacific ocean. There are no sudden changes of temperature. Blizzards and cyclones are unknown. There is no malaria; no hot summers; no hard winters. Making due allowance for water area and waste lands, there is not over 5% of the land fit for agricultural purposes now under cultivation. With its natural resources undeveloped, its dairy and agricultural interests yet in their infancy, Coos county can and will in the future maintain a large population.

Population, estimated at	9,500
Gross value of property for 1897	$2,920,405
Number acres land patented	464,662
Number acres land not patented	850,000
Number acres land under cultivation	18,758
Nunber acres land in pasture about	21,000

The tax levy for 1897 is: State tax, 8¼ mills; for school purposes, 5 1/10 mills, and for county purposes, 18 4/10 mills. The county is divided into 7 justices' districts, 46 road districts, and 72 school districts. The number of persons over 4 and under 20 years of age is 4,025, and the money apportioned for school purposes in 1897 was $9,363.76, county fund, and $4,186, state fund.

MAIL ROUTES AND POSTOFFICES.

There is a daily mail from Roseburg, Douglas county, via Myrtle Point, Coquille City, and Marshfield, to Empire City. A daily river route (Sunday excepted) from Myrtle Point to Bandon. A triweekly route from Gardiner, Douglas county, to Empire City, and a daily route from Bandon to Curry county. Short routes diverge from the first two mentioned routes to all sections of the county. The postoffices are: Empire City, Marshfield, Bandon, Bullards, Prosper, Parkersburg, Riverton, Coquille City, Arago, Norway, Myrtle Point, Lee, Fairview, McKinley, Gravel Ford, Sitkum, Elliott, Custer, Etelka, Rural, Oak, Bridge, Remote, and Bancroft.

TOWNS.

Empire City (incorporated), situated on Coos bay, near the entrance. Population, 250. It has the custom house, 8 general merchandise stores, 2 hotels, 1 drug store, 2 meat markets, 1 machine shop, 3 saloons, 1 cannery, telephone and telegraph office, 2 livery stables, and the largest sawmill in the county. The public school has a daily attendance of 40, and the taxable property in the school district is $157,745. The Odd Fellows are represented here.

Marshfield (incorporated), situated at the head of Coos bay, near the junction of its principal tributaries. Population, 2,000. Has 9 general merchandise stores, 2 hardware stores, 1 bank, 4 meat markets, 4 drug stores, 4 grocery stores, 3 barber shops, 2 livery stables, 3 millinery stores, 2 hotels, 4 boarding houses, 1 bakery, 1 soda water factory, 1 marble and stone works, 1 steam laundry, 2 tailor shops, 2 blacksmith shops, 1 boat-building shop, 2 chop houses, 1 brewery, 2 cobbler shops, 8 saloons, 2 public halls, 3 newspapers, 1 cannery, 1 furniture store, 1 bowling alley, 1 cigar stand, 1 cigar, candy, and notion store combined, 2 jewelry stores, 1 wholesale liquor store, dressmaking establishments, express, telegraph, and telephone office, 4 physicians, 2 dentists, and 6 attorneys, terminus and machine shops of the Coos Bay, Roseburg, and Eastern Railroad and Navigation Company, and adjacent, the coal bunkers of the Beaver Hill and Oregon Coal and Navigation Company. Marshfield has 6 churches, 1 public school, with an attendance of 300. Nearly all the lodges are represented. It has an electric light plant and water works. Valuation of town property, $311,808. Valuation of property in school district, $380,825.

Coquille City (incorporated), county-seat of Coos county, situate on Coquille river, near the center of the county. Population, 1,000. Has 5 merchandise stores, 1 hardware store, 3 drug stores, 2 grocery stores, 1 dry goods and clothing store, 2 hotels, 3 blacksmith shops, 2 livery stables, 2 milliners, 2 saloons, 2 weekly newspapers, 5 churches, 1 academy, 1 public school, 2 shoemakers, 1 notion and millinery store, 3 meat markets, 1 candy and cigar store and billiard hall, 2 restaurants, 2 photograph galleries, 1 machine shop, 1 jeweler and watchmaker, 2 dressmakers, 2 physicians, 1 dentist, 4 attorneys, 1 sawmill, 1 broomhandle mill, railroad station, express and telephone office, various fraternal organizations. Taxable property of school district, $116,094.

Myrtle Point (incorporated), situate on Coquille river, at head of tide-water. Population, 500. Has 4 churches, various fraternal organizations, eastern terminus of Coos Bay, Roseburg and Eastern Railroad and Navigation Company's line, 4 general merchandise stores, 2 grocery stores, 2 bakeries, 2 drug stores, 2 hardware stores, 2 confectioneries, 1 bazaar, 2 harness shops, 2 shoe shops, 3 blacksmith shops, 2 hotels, 1 furniture store, 1 meat market, 1 skimming station, 1 weekly newspaper, 2 cabinet shops, 1 cooper shop, 3 livery stables, 1 sawmill, 1 shingle mill, 1 jewelry store, 1 brick yard, express and telephone office, public school. Taxable property of school district, $89,755.

Bandon (incorporated), situate near the mouth of Coquille river, pouplation 750, has 2 general merchandise stores, 2 hardware stores, 1 drug store, 2 hotels, 1 meat market, 1 brewery, 1 shoemaker, 2 grocery stores, 3 saloons, 1 weekly paper, 5 churches, 1 livery stable, public school, daily attendance 152, telephone office, 1 candy store, 1 cigar factory, 1 blacksmith shop, 1 woolen mill, 1 broomhandle mill, box factory, United States life-saving station. Valuation of taxable property in school district, $133,453.

North Bend, Porter, Bay City, and Libby, on Coos bay, and Progress, Parkersburg, Riverton, and Beaver Hill, on Coquille river, are mining and milling villages.

AGRICULTURE.

There is a small per cent. of naturally cleared land in Coos county. Proper culture, with the precipitation, insures regular and good crops. There are no blighting winds, and no destructive insects. Clover grows on all the soils= bottoms, benches, and hillsides. The yield of crops per acre in 1897 was: Wheat, from 20 to 40 bushels; oats, from 35 to 100 bushels; barley, from 40 to 130 bushels; corn, from 25 to 50 bushels; peas, from 40 to 60 bushels; potatoes, from 300 to 500 bushels; beets, from 20 to 30 tons; hay, from 2 to 3 tons at single cutting.

The approximate amount of agricultural products produced in 1897, and their value, is as follows:

Articles.	*Amount.*	*Value.*
Wheat, bushels	18,500	$ 11,100
Oats, bushels	95,700	34,452
Barley, bushels	25,300	11,385
Corn, bushels	21,300	12,780
Peas, bushels	1,560	1,170
Rye, bushels	110	66
Potatoes, bushels	109,700	27,425
Hay, tons	12,400	74,400
Beets, tons	3,350	16,750
Carrots, tons	2,370	23,700
Onions, pounds	54,080	1,081
Beans, pounds	29,300	732
Honey, pounds	12,400	1,240
Grass seed, pounds	6,500	650
Hops, pounds	3,000	240
Tobacco, pounds	110	22
Bacon, pounds	181,600	14,528
Lard, pounds	15,000	1,500
Total		$ 233,211

DAIRYING.

The dairy industry of Coos county is yet in its infancy. Its future possibilities are great. The equable climate, no hot weather and seldom any frost, and the assurance of an average food crop, makes Coos county an ideal place for the dairyman.

The first creameries were built in 1892. There are at present four coöperative and two custom creameries and cheese factories: Coos Bay creamery and cheese factory (coöperative), situate at the mouth of Coos river; Ten Mile creamery and cheese factory, situate on Ten Mile lake; Bessey Brothers' creamery, situate on South Coos river; Coquille Creamery (coöperative), situate on Coquille river, near Coquille City; Arago creamery and cheese factory (coöperative), situate at Arago, on Coquille river; Moser cheese factory, situate at Gravel Ford, on Coquille river, and Erdice skimming station, situate at Myrtle Point.

There has been a lack of interest manifested in the improvement of dairy herds, except in the selection and improvement of the common cow. Lately, however, the Jersey, Guernsey, and Alderney have been introduced by progressive dairymen.

The following is the estimated output of the creameries and dairies for the year 1897:

Articles.	*Amount.*	*Value.*
Creamery butter, pounds	845,240	$ 70,420
Creamery cheese, pounds	81,286	6,652
Dairy butter, pounds	150,000	27,000
Dairy cheese, pounds	130,190	10,415
Skim milk (estimated)		5,500
Milk not manufactured (estimated)		7,000
Total		$ 126,987

FRUIT CULTURE.

The climate is well adapted to the culture of apples, pears, plums, prunes, and cherries. All kinds of berries thrive and produce large crops. The climate is not adapted to the culture of peaches and grapes, however, hardy varieties bear average crops in favored localities. Curculio and codlin moth are unknown. Cranberry culture is receiving some attention and has been proven a success. The future of this industry is very encouraging. Thousands of gallons of wild dewberries and blackcap raspberries were gathered in 1897. The following is the estimate for the crop of 1897:—

Articles.	*Amount.*	*Value.*
Apples, bushels	88,800	$ 8,800
Pears, bushels	2,500	1,200
Prunes and plums, bushels	9,800	3,900
Cherries, gallons	4,500	1,300
Berries cultivated, gallons	7,500	1,500
Cranberries, bushels	600	1,500
Total		$ 18,200

SHEEP RAISING.

This industry is not as extensively followed as it might be. Sheep are healthy and thrive well. The tax roll of 1897 states the number of sheep to be 7,760 head. The resources from this industry for 1897 are estimated to be:—

Articles.	*Amount.*	*Value.*
Wool, pounds	49,616	$ 4,960
Sheep sold and exported, head	2,300	4,600
Sheep consumed, head	2,000	4,000
Total		$ 13,560

CATTLE AND OTHER LIVE STOCK.

The tax roll of 1897 gives the following information:—

Horses and mules, head	2,090
Cattle, head	11,918
Swine, head	3,389

With pasture the most of the year, and more or less browse in the timbered land, and no flies to pester, all kinds of live stock thrive well in Coos county. Some attention has been given to the introduction of improved breeds of cattle and hogs. The resources from this industry for the year 1897 are as follows:—

Articles.	*Amount.*	*Value.*
Cattle exported, head	3,500	$ 35,750
Cattle consumed, head	1,600	24,000
Hogs exported, head	310	1,800
Hogs consumed, head	1,500	9,000
Total		$ 70,550

POULTRY.

This is an industry which deserves some attention. The equable climate and abundance of green feed is favorable to this industry. There is a local demand for poultry and eggs, and all surplus is shipped to San Francisco. The following is a conservative estimate of the resources from this industry:

Chickens, turkeys, geese, and ducks	$ 5,000
Eggs, 75,000 dozen	9,375
Total	$ 14,375

LUMBERING.

Lumber is one of the principal exports of Coos county. Coos bay is the principal manufacturing center. There are 5 saw mills on Coos bay, with an aggregate daily capacity of 300,000 feet. On Coquille river are 6 saw mills, doing principally an export business, with an aggregate daily capacity of 120,000 feet, also 4 local custom mills. The output of the mills for 1894 was:—

Article.	*Amount.*	*Value.*
Lumber, feet	28,124,700	$ 225,900
Laths, number	2,332,720	3,381
Broom handles, unfinished, number	132,600	762
Pickets, number	11,000	1,100
Total value		$ 231,143

SHIP BUILDING.

The following vessels were built during 1897:—

At North Bend Mills, on Coos bay:—	
Barkentine "Encore," value	$ 30,000
Schooner "Repeat," value	20,000
At Wall Brothers Mill, Myrtle Point:—	
Two small river steamboats, value	3,000
At Prosper Mills, Coquille River:—	
A small schooner in course of construction	
Total	$ 53,000

FLOURING.

The principal flouring mill, roller system, was destroyed by fire in 1897. There is one water power, burr mill and one chopping mill situated on the Coquille river. The output of these mills is small, being for 1897—

Flour, 1,000 barrels, value	$ 4,000
Corn meal, 3 tons, value	120
Feed stuffs, 120 tons, value	2,160
Total	$ 6,280

OTHER MANUFACTURING.

The other manufacturing interest of Coos county are woolen mill, 1 stave and boxmill, 2 broomhandle mills, 2 shingle mills, 1 tubmill, 1 boxmill, and 1 tannery. The output of these mills for 1897, are as follows:

Blankets, 1,778 pairs; flannel, 286,124⅓ yards; mackinaws, 2,259⅓ yards, total value	$ 84,000
Broomhandles, finished, 1,160,000, value	11,600
Shingles, 467,000, value	817
Staves, boxes, and buttertubs, value	5,000
Leather, 16,000 pounds	4,800
Total	$ 106,217

FISHERIES.

There are two salmon canneries on Coos bay, and two on Coquille river. Only one of these was operated in 1897. The output is as follows:

Canned salmon, 12,000 cases, value	$ 36,000
Salt salmon, 2,450 barrels, value	14,500
Total value	$ 50,500

MINES, MINERALS, AND STONES.

Four hundred and fifty square miles of the area of Coos county is underlaid with a superior quality of lignite coal. Only about 2 square miles have been mined. In many places 3 and 4 strata, from 3 to 6 feet thick, overlie each other. There were two mines in active operation, and 6 in course of development in 1897. The output of coal was 96,000 tons, valued at $140,000.

The Klamath range traverses the southern portion of Coos county, and here are found indications of rich mineral deposits. In 1865 a bowlder was found weighing about 200 pounds, which yielded $2,700 in gold. In 1896 a surface pocket yielded over $2,000, and several finds of less value have been made since. Prospecting is difficult, owing to the dense growth of timber and brush. Ledges have been discovered which pay from $4 to $7.50 per ton, but everyone is looking for the source of the rich bowlders. There is much base ore. Specimens of nearly pure copper have been found in the streams, and platinum is found in the beach placers. There are probably 50 placer mines being operated on a small scale in Coos and Curry counties. High bars are found which show a rich prospect, but it is expensive to get water to them.

North and south of the mouth of the Coquille river are beach mines. These were discovered in 1852, and they have been worked about every year since, being replenished by the action of the surf washing out the slides from the bluffs. A five-stamp quartz mill was put up on Johnson's creek at a great expense. It was operated only 30 days and then shut down on account of litigation. The output of the mines for 1897, is estimated at $20,000 in gold.

On the south fork of the Coquille river, is found a heavy stratum of blue sandstone, from 3 inches to 2 feet in thickness. The outcroppings show little sign of erosion.

On Coos river is a quarry of sandstone, which has been tested and found to be durable.

Brick clays are found, and in the delta formation at the mouth of the Coquille river, formed by surf action, are found heavy deposits of black sand, principally chrome iron.

TIMBER.

Ten billion feet is the estimate of the merchantable timber in Coos county. The timber growth consists of fir (Oregon pine), three species, red, yellow, and white, red and white cedar, spruce, hemlock, yew, myrtle, maple, ash, white and live oak, alder, dogwood, madrone, chittem, and numerous smaller growths, principally crabapple and willow.

The relative percentage of the timber is approximately as follows: Fir, 75%; white cedar, 10%; spruce, 10%; and the hard woods, 5%. The white cedar is a valuable wood for finishing purposes and ship-building. It is a firm, durable wood, and carries an aroma obnoxious to insects; hence, especially valuable for cupboards. It is also exclusively used on this coast for the manufacture of matches. It is found only in Coos county and a small portion of Curry and Douglas counties. The myrtle and maple are fine grained woods, especially useful for furniture. The myrtle is a beautiful grained wood, susceptible of a high polish. It wears smooth and does not splinter, therefore it is used for windlap, stocks bits, clocks, jaws, chats, fender-rails, etc.

Besides lumber, the other resources from the timber are as follows:

Article.	*Amount.*	*Value.*
Matchwood, cords	1,000	$ 5,000
Ship knees		800
Chittem bark, pounds	71,000	2,130
Cordwood, cords	600	1,200
Piles		1,200
Miscellaneous		1,000
Total value		$ 11,330

SILK.

Article.	*Amount.*	*Value.*
Cocoons produced up to 1897, pounds	228	$
Reeled silk produced up to 1897, pounds	76	456

TRANSPORTATION FACILITIES.

During the year 1897 there were 6 steamers and 10 sailing vessels making regular trips to Coos bay from San Francisco, and 2 steamers running regularly in the San Francisco, Portland, and Coos bay trade. There are 2 bar tug boats, and 6 small freight and passenger steamboats employed on Coos bay and its tributaries. The average, per month, of arrivals was 26 steam and 5 sail vessels.

Two small steamers and schooners made regular trips from San Francisco to Coquille river. There is 1 bar tug boat and 4 small passenger and freight steamers employed on the Coquille river. The average, per month, of arrivals was 8 steam and sail vessels.

The Coos Bay, Roseburg, and Eastern Railroad and Navigation Company have constructed and are operating a railroad from Marshfield, on Coos bay, to Myrtle Point, on the Coquille river, a distance of 28 miles, and it will in the near future be constructed to Roseburg, in Douglas county. Most of the passenger and a considerable portion of the freight traffic of the Coquille valley, and milling logs, are handled by this road.

COMMERCIAL STATISTICS OF COOS BAY FOR THE YEAR 1897.

Vessels arriving, steam, 311; registered net tonnage	104,440·78
Vessels arriving, sail, 58; registered net tonnage	9,892·98
Vessels departing, steam, 308; registered net tonnage	106,424·79
Vessels departing, sail, 56; registered net tonnage	6,788·79
Imports miscellaneous merchandise, tons	9,998
Passengers arriving by steamer	1,740

EXPORTS.

Coal, tons	85,129
Lumber, feet, board measure	20,648,706
Lath	2,283,000
Matchwood, cords	822
Firewood, cords	862
Broomhandles	97,800

Pickets	11,000
Piles	96
Cattle, head	4,962
Horses	1
Chittem bark, pounds	47,000
Ships' knees	148
Telegraph poles	18
Apples, boxes	41,120
Potatoes, sacks	30,990
Butter, pounds	431,000
Cheese, pounds	211,480
Sheep, head	1,654
Hogs, head	160
Hides, pounds	68,000
Leather, pounds	38,000
Wool and woolen goods, pounds	53,000
Salmon, cases	16,350
Miscellaneous, tons	2,703
Passengers departing	1,675

COMMERCIAL STATISTICS OF COQUILLE RIVER FOR YEAR 1897.

Vessels arriving, 95; registered net tonnage	11,806·19
Vessels departing, 98; registered net tonnage	12,611·60
Imports miscellaneous merchandise, tons	8,184
Imports machinery, tons	22
Passengers arriving	40

EXPORTS.

Lumber, feet	6,830,000
Broom handles	128,000
Coal, tons	7,710
Salt salmon, pounds	160,000
Match wood, cords	840
Wool, pounds	44,000
Sheep, head	650
Cattle, head	820
Hogs, head	150
Potatoes, bushel	500
Butter, pounds	16,000
Canned salmon, cases	6,327
Shingles	80,000
Apples, boxes	200
Woolen goods, pounds	24,000
Hides, pounds	6,000
Miscellaneous, tons	20
Passengers departing	60

RECAPITULATION.

Agricultural products	$ 233,219
Fruit	18,200
Sheep raising	18,560
Cattle and other live stock	70,550
Poultry	14,875
Dairying	126,987
Lumbering	231,143
Ship building	53,000
Flouring	6,280
Other manufacturing	106,217
Fisheries	50,500

Mines	160,000
Lumber	11,330
Silk	456
Total	$1,095,817

The foregoing is compiled from reports of the road supervisors, for the agricultural statistics, and from the creameries, mills, etc., for the other statistics. Care has been taken to avoid, as much as possible, double estimates—that is, for example, the grain which has been ground is not included in the other estimates. The fodder crops are represented in the butter, etc., produced. The value of garden crops has not been considered. It is a conservative estimate.

CURRY COUNTY.

By Frank A. Stewart.

Population	3,000
Acres under cultivation, plowed	8,000
Acres under cultivation, sown to tame grass	50,000
Bushels of wheat	1,200
Bushels of oats	20,000
Bushels of barley and rye	5,000
Tons of hay	12,000
Bushels of corn	3,000
Pounds of butter and cheese	800,000
Pounds of tobacco	500
Pounds of hops	100
Bushels of potatoes	30,000
Bushels of apples	20,000
Bushels of prunes and plums	6,000
Barrels of salmon	500
Cases of salmon	19,000
Cords of tanbark	800
Tons of coal	50
Ounces of gold-dust, at $17 per ounce	3,000
Feet of lumber	400,000
Pounds of wool	125,000
Number of sheep	25,000
Number of hogs	3,000
Number of horses	1,500
Number of mules	100
Number of cattle	10,000

Curry county is situated in the southwest corner of the state, has a coast line of 70 odd miles, an area of nearly 1,500 square miles, or about 1,000,000 acres, three fourths of which is vacant, and more than one half unsurveyed.

The topography is mountainous, with numerous plateaus of various sizes and elevations, and generally covered with valuable forests or brush. Many fine streams cut rugged channels through its bosom and empty into the ocean. On all these streams rich bottom lands abound, which were located by the earlier settlers, and form the backbone of the agricultural wealth of the county, although there are many mountain ranches that dispute the superiority of the alluvials. The largest body of level land lies in a triangular shape, with its apex at Port Orford and its base extending to Coos county. This is an old ocean bed raised up, with an old beach, rich in gold, running along the foothills. The whole of this tract is underlaid with sandstone, and is undoubtedly a continuation of the coal fields of Coos.

Geologically Curry county is one of the most fascinating fields in Oregon, yet it has never been thoroughly exploited by capable men. Professor Condon has said: "Rogue river is the oldest river in Oregon." It cuts its way through igneous rocks from source to mouth, and the mountains, which wall its golden beds, are full of minerals, waiting the magic touch of capital and intelligence to leap into prominence. Nearly every known metal has been found in the mountains of Curry.

Gold is found in the inexhaustible sands of our beaches, which, although they have been mined for nearly half a century, still yield a scarcely diminished output. These mines are mainly worked in winter, when water is abundant, and the heavy surf sluices off the light, worthless sand, throwing in new sand, and ever renewing the places that have been worked. The gold is caught on copper plates and burlap. It is doubtful if this simple, perfect method will ever be improved for beach mining, inventive cranks to the contrary notwithstanding.

Gold is also found in nearly all our streams, in all parts of the county. But Sixes river is the richest, and, although it has been mined for more than 40 years, there are now scores of men working on its bars and tributaries with good results. On Elk, Lobster, and Chetco the busy miner is at work. Rich ledges have been found on Elk and Sixes, and in many other places; but the isolation of the country has kept out capital and prevented proper development.

Much of the gold from the mines of Curry goes out into Coos, Douglas, and Josephine counties, and thus Curry does not get full credit for the amount she produces. I believe that we vastly underrate when we assert that the average anunal yield for 40 years has not been less than $50,000. As more miners are now at work than usual, the yield for the coming year will be augmented.

Rich copper ore has been found in many places; but those near the mouth of Rogue river are the most promising. Development work is now going on on 2 of these ledges. A Portland company is getting out ore from one of these mines for its first shipment.

Borate of lime has been extensively mined on the coast near Chetco, the bed yielding the largest prices ever found. But this rare mine is now tied up by litigation.

Chrome abounds in several localities, one bed near the mouth of the Illinois river—which empties into Rogue river in this county—producing the purest samples in the world. The cost of getting this chrome down Rogue river has, hitherto, prevented its shipment.

It has been often asserted by well-informed men that no extensive body of good iron ore exists on the Pacific coast. Such is not true. In one of the remote sections of this county the writer has stood upon a solid mountain of the most valuable of the ores of iron—a mountain before which the famed mountain of Missouri shrinks to a molehill. This ore can be taken on a down grade to the coal mines, which have been developed in the last two years. The coal is a coking coal, and is pronounced the best ever found west of the Rocky mountains. These coal mines are on Rogue river, about 25 miles from the coast, and they prove the force of Professor Condon's assertion as to the age of this section. This vein is said to be 7 feet, horizontal, and with natural drainage. Development work is now going on. The river steamer Bismarck was brought down from Portland to Rogue river in September to tow the coal down to tide water.

Just below the coal mine is a beautiful townsite of several hundred acres, at the mouth of the Illinois. Gold, copper, chrome, and iron ores surround this basin of coal, as if a divine hand placed them convenient to the hand of man; and the day is not far distant when a "smoky city" will rise in this sequestered place.

A government engineer, in looking up the feasibility of the proposed harbor improvement at Port Orford, found, a few miles southeast, an acceptable mountain of granite. The sandstone quarry at Point Blacklock lies on the coast, a few miles to the north. The very finest freestone is found at Mack's Arch, and in a prodigious quarry at Hunter's Heads. Both these places are fine summer harbors. At Hunter's Heads the splashing surfs of winter have uncovered the stone for hundreds of feet, exposing the horizontal layers, that remind one of a gigantic stairway. Bold water fronts this mammoth quarry; and its largest stones could be slid on an incline, or swung by derricks, aboard vessels. It would be well worth the while of business men of Portland or San Francisco to investigate this quarry. Twenty-five years ago they were shipping from Japan to San Francisco freestone not equal to this.

While this is preëminently a timber region, no large sawmill is cutting lumber. A few small ones cut for their respective localities, the aggregate being insignificant. Port Orford cedar, the most valuable of all our large timber, and the various firs, are found throughout the county. Myrtle and maple are abundant along the streams. Ash and white oak are rather scarce. Next to cedar and fir, our most valuable forests are tanbark oak—this county being, so we are told, the northern limit of this most valuable tree. Upon the bark of this tree many settlers depend for their living, and upon its acorns hundreds of hogs are growing fat. As the supply of tanbark is nearly exhausted to the southward, the outlook for this industry here is flattering. The beauties of these oak forests, and the value of their acorns, proclaim the bark-pulling industry an act of vandalism.

Manufacturing, in its proper sense, cuts no figure in this county. Hume's cannery at Rogue river is the chief. There is a small cooper shop at Dairyville for local trade, and a small tannery at Chetco. All our flour, even, comes from San Francisco, though we occasionally buy a sack of Oregon flour, as an act of loyalty and in memory of "Auld Lang Syne." The era of manufacturing is lagging behind.

Dairying is the chief occupation of those who own land adjacent to the coast. Where grass is green all the year, dairying and stockraising will supersede graingrowing, hence the last will never be very important along our damp coast. There are several fine creameries in the county. More land is being seeded to grass every year; the number of cows milked is constantly increasing everywhere, and in all lines our dairymen are progressing.

Raising live stock is an important industry. The wool from this county is especially valuable, on account of its constant growth and consequent strong fiber. All our stock is well bred. This year the county was drained of its surplus sheep and cattle, most going east, and many shipped by steamer from Port Orford to San Francisco. As a fruit region Curry will hold her own with any county in the state. Apples, pears, plums, prunes, cherries, and even figs ripen to perfection. Along Rogue river peaches, grapes, and melons do excellently. The coast is the natural home of berries, vegetables, flowers, and shrubbery. Our salmon fisheries are very valuable, affording employment to many persons. At the mouth of Rogue river R. D. Hume has a first-class cannery, the only one in the county. Small salting works are carried on at Chetco, Pistol, Elk, and Sixes rivers. Our commerce is almost exclusively with San Francisco, by water. Portland has scarcely made an effort to establish trade relationship. A Portland coasting steamer should extend her trips to Port Orford.

Homeseekers will find vacant lands on our plateaus and mountains that can be made into good, independent homes by frugal, industrious people. Lands can be bought at reasonable figures. Our best places are not often for sale at any price. A good road runs along the coast, connecting with the roads of adjoining counties. All the streams have either good bridges or ferries. This route abounds in beautiful scenery, and is especially fascinating when the wild flowers are in bloom. Our climate on the immediate coast is the most equable in the word. All our coast south of Cape Blanco is exempt from Northwest fogs in summer. The wind blows from the warm south in winter, and from the cool north in summer. We wear equally warm clothes and sleep under equally warm blankets in summer as in winter. Our schools will compare with those of any county in the state. There are no illiterate children in the county, except late arrivals. Our people are generally intelligent, hospitable, industrious, contented, and independent.

JOSEPHINE COUNTY.

By Rev. R. McLean in Oregonian, January 1, 1898.

Josephine county is one of the richest, and yet one of the least-developed portions of Orregon. Early in the '50s it had a large mining population, who overran the surface of the country, mining where there was large pay with little outlay. When the rich surface placers appeared to be exhausted the tide of industry ebbed, leaving the real wealth of Josephine county practically untouched. To understand wherein that wealth really consists it is necessary to know something of the topography of the country. It lies between the Coast and the Cascade ranges of mountains, taking in the eastern and the western slopes respectively, and reaches up onto the northern slope of the Siskiyou range. As these mountains are rich in minerals, Josephine county, by its location, has the finest placer mines in Oregon. These mines are now being systematically developed, and it is estimated by practical mining men that, with the average water supply, there will be produced this season three times as much gold as ever before in the history of the county.

The quartz mines are also attracting a great deal of attention. A large number of very promising ledges have been uncovered within the past few years, but upon only a few of them has there been any great amount of development work done. Those that have been thoroughly tested have given abundant evidence of the richness and permanence of the ledges of Southern Oregon, and there is no doubt that this section will prove to be one of the richest on the Pacific coast. With the recent improvement in methods of treating refractory ores, large bodies which, under the old system, would not pay for working, will now bring handsome returns to investors.

The mines of Josephine county are only a part of her resources. The streams that make placer mining so profitable can also be used for the purpose of irrigation; and there are large bodies of fine agricultural land that only require water to make them as valuable as the mines in the production of wealth. So completely have the citizens been engrossed in the development of their mineral wealth that the agricultural possibilities of this region have been in a great measure ignored. Nothing finer in the way of agricultural possibilities can anywhere be found than in the fertile valley of the Rogue river. From this valley come the choicest fruits and vegetables; while the output of melons is something prodigious. The great northern market is supplied principally from this section

One source of financial weakness is found in that the interest in and development of the agricultural interests has not kept pace with mining and other industries. As a consequence, there is an enormous drain upon the county to pay for hay, meat, flour, and feed, all of which might be produced in abundance with systematic farming. In time, with a more intelligent comprehension of the value of the market and of the resources, this will be remedied, and Josephine county will produce her own hay, feed, meat, and bread.

There are great possibilities, also, in the lumber industry. The Cascade, Coast, and Siskiyou ranges of mountains are covered with bodies of fir, cedar, sugar and yellow pine, whose total value it would be difficult to estimate. Although there has been a large lumber industry carried on here for years, the best bodies of timber are as yet practically untouched. A railroad is needed to open up to market these great timber belts. A road crossing Eastern Oregon, through the great stock and grain country of Harney valley, northern Klamath and southern Crook counties, then crossing the Cascades near the famous Crater lake, thence down Rogue river to Grant's Pass, and from that point to the coast in Northern California, would open up a vast country, rich in grain, stock, fruit, minerals, and timber, and would give to Josephine county such access to and outlet for her products as would make this one of the wealthiest counties in the state. Not only would it open up to market the large agricultural region, now closed for want of transportation facilities, but it would also pierce the great redwood belt of Del Norte county, just across the California line.

With only one railroad, and all its consequent disadvantages, the lumber trade of this county has assumed large proportions. Having passed through the trying period of practically free trade, and that without closing down for any length of time, the largest Grants Pass company is doing a better business than ever before. It is one of the largest establishments in Oregon, and is now running night and day to fill orders.

Another industry, still in the experimental stage, is the manufacture of wool for mattresses, and extracts from pine needles. There are now two establishments experimenting to perfect here the process that has been so successful in Germany. They are assured of success, and, as there are tens of thousands of tons of the needles here, this industry will furnish employment for a large number of persons not capable of doing heavier work.

Perhaps no better showing of the condition of the county and the growth of its business can be given than by comparing the earnings of the railroad for a term of three months with the corresponding months of last year. From figures furnished by Agent Purdom, we find that for the three months ending November 30, 1897, the traffic, in both freight and passengers, showed an increase of nearly 5% over the corresponding period of 1896.

JACKSON COUNTY.

By F. D. Wagner, Ashland.

Population	15,000
Acres under cultivation	70,000
Bushels of wheat	250,000
Bushels of oats	30,000
Bushels of barley and rye	40,000
Tons of hay	50,000
Bushels of corn	60,000
Pounds of butter and cheese	20,000
Pounds of hops	10,000
Bushels of potatoes	100,000
Bushels of apples	300,000
Pounds of dried fruits	200,000
Bushels of prunes and plums	30,000
Boxes of peaches	300,000
Ounces of gold dust, value	$ 250,000
Feet of lumber and logs	27,500,000
Pounds of wool	150,000
Number of sheep	20,000
Number of hogs	25,000
Number of horses	4,000
Number of mules	300
Number of cattle	15,000
Poultry, value	$ 15,000
Grapes sold in 1897, value	$ 20,000

Jackson county, which includes nearly all the Rogue river valley proper, is situated on the southern boundary line of Oregon, and west of the Cascade range of mountains. It comprises a territory nearly 50 miles square, the valley itself being 25 miles long by 5 to 15 in width. It is the acknowledged center of the most delightful climatic belt on the Pacific coast—a golden mean between the excessive moisture of the Willamette valley and Puget Sound country at the north, and the scorching summer droughts of the California valleys at the south. The rainfall at Ashland, as shown by the government weather bureau, has averaged a trifle over 20 inches per annum for the past 19 years, and varies from 15 to 25 inches in different years, with enough moisture always to insure crops. The minimum temperature recorded during that period was 2° below zero. Such temperature is very rare. During 1896 the thermometer did not register lower than 15° above zero at any time, and during 1897 the lowest recorded temperature was 12° above. The temperature seldom goes above 90° in summer, though in the phenomenal warm weather of the summer of 1897, it passed the hundred mark at Ashland for a few days. The average mean temperature at Ashland during 1896 was 52·5°, which can be taken as a fair index for other years. The elevation above the sea at Ashland (the head of the valley) is 1,942 feet.

Among the industries that thrive may be mentioned mixed farming, fruit growing, stock raising, and manufacturing. In the list of industries which add to the wealth and prosperity of Jackson county, one of the first, if not the first in point of importance, present and prospective, is that of gold mining—quartz and placer. It is estimated that the gold mines of Jackson county, since first discovered in 1850, have yielded a total of $30,000,000. This is thought to be a conservative estimate. Jackson county was the center of a great gold excitement in early days, and fabulous sums were washed out of the gravel beds along the various streams in the days of pioneering here. Succeeding the slow methods of the "rocker" of those days, and the gradual working out of many of the richest placer beds, came hydraulic mining, employing more capital, and, in many instances, yielding even greater proportionate returns. In still later years the more general study of mineralogical conditions and the practically limited field offered by the still profitable and successful hydraulic process, led prospectors for the yellow metal to more thoroughly investigate the source of all these rich placer deposits, and with encouraging results, so that the county is now entering upon an era of quartz mining development that promises not only to be a source of equally as much or more wealth per year as early placer mining, but to be of much more permanence. Our mountains are ribbed with quartz veins, whose richness in gold and other precious metals needs only capital to establish. And capital, now so generally interested in gold mining, has begun to look into our quartz prospects in earnest. As this is written, the ink is hardly dry upon the papers which consummated a deal at Ashland involving a cash outlay of $20,000, in the mere purchase price of one property within three miles of Ashland, by eastern capitalists, who will spend many thousands more in further development of this and adjoining quartz properties, which they have also acquired, and which they invested in only after a most thorough investigation and indorsement by experts experienced in the mineral formations in all the leading mining sections of the United States. This deal in itself is looked upon by many observers as marking the beginning of an important epoch of permanent quartz mining development in Jackson county. Riding in a Pullman palace car to within a few miles of a rich, but yet almost unknown mining section, with golden opportunities for capitalists, is lacking in the romance and hardships of travel and climate connected with the gold fields of the Klondike, and of Alaska, or the enchantment of distance lent to South Africa, but it is not difficult to find mining men experienced in all these regions who are content to take their chances here.

The fruit growing industry is one of no little importance in Jackson county. The soil and climate are adapted to the successful growing of fine fruit in great variety, including apricots, peaches, pears, plums, prunes, quinces, apples and all small fruits and berries which surpass in quality those of the famed fruit sections of California. Ashland peaches were awarded first honors at the great world's exposition, in Chicago, in 1893, and they have this season competed successfully in the markets of the East with the fruit of the best peach regions of America.

Grains, including wheat, oats, barley, rye, and Indian corn, are raised without irrigation, and the crops never fail. Alfalfa hay is produced in large quantities, and is a valuable and profitable crop. Stock farming is another source of much wealth to the county, and the unusually good markets and satisfactory prices of the present season have brought a good measure of prosperity to the stockman.

The forests of Jackson county hold a vast wealth of sugar pine, yellow pine and fir, yet almost in the virgin state. It is estimated that the extensive lumbering mills at Pokegama, just over the state line in California, have drawn on the timber of Jackson county during the year 1897 to the extent of 25,000,000 feet, at a cost of $5 per 1000 feet. The mills in this county have probably used 2,500,000 feet of logs during the same time.

Mineral springs, including soda, sulphur, and iron, abound, and are a source of attraction to the outside world. Thousands of our home people and hundreds from abroad visit them and enjoy their health-giving waters each year.

Jackson county's assessable wealth approximates $5,000,000, and the population 15,000. The people are always fairly prosperous—there is probably less opportunity here than any place else in the world to be otherwise. They have experienced the hard times the past few years with the rest of the country, and it cannot be said that the "calamity howler" has not been abroad in the land. But 1897 has been the worst year the Jackson county "calamity howler" has experienced in half a dozen years past. The year has furnished many indications of a healthy business revival in almost every part of the county. The mortgages of boom times have not all been removed from the records, but every farmer, orchardman, stockman, and business man, as well as the miner, feels that things are "easier" and as if a burden had been lifted from his shoulders. Real estate changes hands again, and people buy and sell with more confidence, so that in all there seems to be an increase of business all around.

Jackson county has a world of wealth in her soil, her climate, her forests, her waters, all yet practically in the infancy of their possibilities. And the era of general prosperity now fairly opened in the country generally must make an impression upon her many and diversified resources.

The chief towns of the county are Ashland, Medford, Jacksonville, Gold Hill, Central Point, Eagle Point, and Phœnix. Ashland is in the southern part of the county, within 20 miles, by rail, of the California line. It has a population of 2,500. Medford, 12 miles north of Ashland, has a population nearly as large. Both towns have good schools and churches, and are up with the times in modern improvements, having electric light and telephone systems, and many handsome and comfortable residence houses. At Ashland are flouring mills, a woolen mill, planing mills, a quartz mill for working the ores from mines in the neighborhood, a state normal school, and the tabernacle of the Chautauqua Association of Southern Oregon. The eating station, roundhouses, and other appurtenances of division end of the Southern Pacific railroad are located here. The town has an abundant supply of pure mountain water for domestic use, for fire protection, and for power—all its factories and electric light plant taking their motive power from the stream which flows through the town. Medford is located nearer the central part of the valley, and has the best of advantages as regards the trade of the county. It has a distillery, a brewery and ice manufacturing plant, flouring mill, and planing mills. Medford and Ashland both do a large business in the exportation of fruits, and Medford is also the center of a large trade in the products of a pork-packing establishment. Jacksonville, the county seat, is 5 miles west of Medford, with which place it is connected by an independent railroad, built between the two places after the construction of the Southern Pacific railroad through the valley. Jacksonville is the oldest town of the valley, and has a population of 600 or 800. Central Point and Gold Hill are both on the Southern Pacific railroad, the former 4 miles north of Medford, and the latter about 12 miles north of Central Point, on the banks of Rogue river. Eagle Point is the trade center of the Butte creek valley, one of the principal arms of the Rogue river valley.

COUNTIES OF EASTERN OREGON.

KLAMATH COUNTY.

By Joseph G. Pierce

Klamath county is preëminently fitted by nature for stock raising, and has no superior as such in the United States. Buyers come from all over the coast to purchase our cattle, because of their well-known superiority to those raised in most sections of the Western states. While but 8,000 to 10,000 head of cattle are turned off annually, 100,000 head should be, for the possibilities are almost unlimited, owing to the magnificent natural systems of irrigation, which only require the helping hand of capital to cause them to turn many thousand acres of waste land into valuable fields which would cut from 5 to 7 tons of alfalfa to the acre. Persons contemplating starting in the business of stock raising in Klamath county should endeavor to breed thoroughbred stock, particularly Herefords, which are claimed to be the best range cattle.

The most valuable of the known natural resources of the county is the pine timber which covers 1,250,000 acres. The largest, best known, and most valuable tract lies north of the Klamath river, and is known as the Jenny creek belt. There is about 5,000,000,000 feet of superb sugar and yellow pine timber in this belt, which is easy of access, either by river or railroad, and size and quality of pine considered, it probably has not an equal in the United States; for, be it understood, the yellow pine has nothing in common with the Southern yellow pine, but both it and the sugar pine are equal to and closely resemble Eastern white pine. The Klamath River Lumber Company, which has a mill—one of the finest on the Pacific coast—at Klamath, on the Oregon and California railroad, is operating in the Jenny creek belt, and will cut 15,000,000 feet of logs this winter. There are several small saw mills in the lake region, which cut about 2,000,000 feet of lumber annually.

Several large irrigation and reclamation projects have been commenced, and some finished during the past two years. For several years 2 irrigation systems have been in effect, proving of untold benefit to the sections in which they are operated, namely, Lost river and Tule lake. The canal running through the former section is about 20 miles long, the water being taken from the Upper Klamath lake; the canal supplying the latter section is about 10 miles long, the water being taken from Lower Klamath lake. A new canal has been surveyed in the Tule lake section to carry water on a higher level. Several miles have already been dug and a flume 60 feet wide built across Lost river. When completed this ditch will be 22 miles long. A levee 1¾ miles long, and from 4 to 9 feet high was completed in November across Lost River slough to keep the waters of Lower Klamath lake from flowing into Tule lake. A levee was recently completed across the inlet to Wocus marsh, an arm of Upper Klamath lake, which reclaims 4,000 acres of meadow land.

A large number of new buildings in the towns and on the ranches have been erected in the past 2 or 8 years, adding much to the substantial development and appearance of the county.

For about 2 years a system of electric lights and water works has been in operation in Klamath Falls, the county seat, the motive power being water supplied by the falls of Link river. The street arc lights are turned on until midnight and the incandescent system is kept running all night.

The following summaries show that much progress has been made in the past two years, and tend to prove that expectations of great progress may be realized in prosperous times, even though railroad builders should continue to ignore the rich harvest that might be reaped in the Klamath basin and Southeastern Oregon.

	State census 1895.	*Estimate 1897.*
Population	2,318	2,500
Acres cultivated	22,946	30,000
Wheat, bushels	68,933	51,784
Oats, bushels	19,235	28,000
Barley and rye, bushels	13,206	25,000
Hay, tons	23,302	30,000
Butter and cheese, pounds	20,767	120,000
Tobacco, pounds	10	10
Hops, pounds	385	400
Potatoes, bushels	12,875	14,000
Apples, bushels	116	1,200
Prunes and plums, bushels	--------	175
Lumber, feet	595,000	22,000,000
Wool, pounds	27,812	110,000
Number of sheep	5,490	12,000
Number of hogs	1,849	2,000
Number of horses	8,407	5,500
Number of mules	166	700
Number of cattle	10,580	20,000

Crater lake, the greatest wonder of the West, was the scene of the Mazama's excursion in August, 1896, and received world-wide fame in consequence, and will be visited each succeeding year by a constantly increasing number of tourists.

LAKE COUNTY.

By Beach and McGarry, Lakeview.

There is perhaps no other part of the state of Oregon so worthy of mention, but so little known, owing to its remoteness and inaccessibility from the railroad, as Lake county. Here is a county with a total area of land surface of 5,049,300 acres. Of this the area appropriated is 696,445 acres; area reserved, 187,000; area unappropriated, unreserved, surveyed and unsurveyed, 4,215,855. Thirty years ago this section had among its population not more than 10 white persons, and now its white population can be safely estimated at 4,000. The county is prosperous, and never more so than at the present time. There are a number of wealthy men in Lake county, most of them stockmen and merchants. Last fall an unusually large number of cattle and sheep were sold out of Lake county, owing to the prices being better than for years past. Still, there are thousands upon thousands of stock grazing upon our hills and valleys. The surface of the country is varied by beautiful valleys, rolling hills, sage brush plains, and low ranges of mountains.

The soil is diversified, consisting of rich black loam, sage brush loam of different grades, and in some places is sandy. But little attention has been paid to farming until within a few years, as nothing in the agricultural line is raised here for export, the great distance to lines of transportation making it impossible to grow agricultural products at a profit. But the settling up of the country, and the probable coming of a railroad in close proximity within a year will make this an extensive farming, as well as stock, county. Wheat has yielded 60 bushels to the acre, and will average 40 bushels. The native grasses have long been a source of wealth to stockmen, and timothy, redtop, and alfalfa grow in abundance.

There is plenty of timber for domestic purposes, and in some sections of the county vast bodies of the finest sugar pine can be found. There are several sawmills now in operation in the northern and eastern portions of the county.

All varieties of fruit, such as apples, pears, prunes, plums, cherries, and all kinds of berries grow hardy and abundantly throughout the county. Lake county does not fear to place her apple, for comparison, beside that fruit grown in any other section of the world.

As soon as the railroads reach this county her vast amount of timber lands will furnish fine opportunities for the investment of capital, and her streams will furnish ample water power for great manufacturing enterprises. The C. & O. R. R. will be extended to Alturas, in Modoc county, within one year. This railroad will then be within 60 miles of Lakeview, and there is no doubt that it will finally reach Lake county. Three roads, in fact, point this way very strongly. Transportation of freight is now made to and from Amadee, the terminus of the N. C. O. R. R. by big teams, and passengers by stages to Amadee and Ager. The entire county is a net-work of stage lines, carrying mails and passengers to different towns and settlements. Telephone and telegraph lines are now being proposed, and it is a proper assertion to make, that really Lake county has "got a move on." A spirit of enterprise seems to have arisen which has long lain dormant in this county, and it is safe to say that within the next two years Lake county will have advanced 25%. The value of property as shown by the last tax roll is $1,384,494.

Lakeview, the county-seat of Lake county, and the location of the United States land office, is the principal town of the county, and, in fact, the principal town in the great lake basin. It is conducted under a city government, and has a population of 1,000. It is situated on the east side of the beautiful Goose Lake valley, and just at the head of the lake. The little city is most delightfully located, resting at the foot of a range of hills overlooking the valley and lake. This is headquarters for all the stockmen, and, in fact, the business center for all the little towns of the county. A splendid system of street work has recently been inaugurated, and the work of street improvement is being rapidly executed. An electric light plant is a new addition to the town's enterprises. The water furnishing the supply for the town, gushes out of the deep cañons and mountain sides, cool and sparkling. The town will soon have telegraphic and telephonic communication with San Francisco and Portland. There is a new spirit of enterprise noticeable all along the line.

Lakeview is about the center of the valley, north and south, and is of easy access from Warner valley on the east, Drew's valley and Sprague river on the west, and Crooked creek, Summer Lake, and Silver Lake valleys on the north. It controls the trade of a large district. Three different railway lines are directing their course toward Lakeview, and everything points to a great future for the county as well as its capital. It has a $14,000 school building, with four departments. There are two churches, Methodist and Baptist. The Odd Fellows, Masons, Workmen, G. A. R., and Foresters all have flourishing lodges. The *Lake County Examiner*, a bright, well-edited newspaper, is published here, and Beach and McGarry are the editors.

Lakeview has 3 hotels, as many restaurants, 3 hardware stores, 6 general merchandise houses, 7 saloons, 1 brewery, 2 livery stables, 2 wagon shops, 1 jeweler, 1 land attorney, public school, court house, 3 barber shops, 5 law offices, 2 newspapers, and other places of business too numerous to mention. Near the town are 3 sawmills, 2 flouring mills, and surrounding the town are many natural curiosities.

HARNEY COUNTY.

A. W. Gowan in Oregonian, January 1, 1893.

Population	3,500
Acres under cultivation	1,000
Bushels of wheat	5,000
Bushels of oats	4,000
Bushels of barley and rye	8,000
Tons of hay	100,000
Pounds of butter and cheese	25,000
Bushels of potatoes	5,000
Bushels of apples	800
Ounces of gold dust	300
Feet of lumber	2,000,000
Pounds of wool	300,000
Number of sheep	72,000
Number of hogs	500
Number of horses and mules	10,000
Number of cattle	55,000

Harney county is 140 miles long and 70 miles wide, and contains 9,800 square miles. About 50% of the area is mountainous; 25% second bottom or bench land, rolling, and sometimes quite high; and 25% bottom land. The records of the Burns land office show that 3,462,407 acres of the 6,200,000 acres in the county have been surveyed. It is estimated that the county has 4,497,933 acres subject to settlement under the various acts of congress.

Harney county has rolling hills, deep cañons, lofty mountain chains, and, consequently, several varieties of climate. There are several valleys. Harney, the largest, is 60 miles long and 40 miles wide.

The settlements are scattered. They are located in the neighborhood of the principal water courses. Harney county could easily support a population of 350,000.

Timber, dense and majestic, and of fine quality for lumber or firewood, covers the mountain sides. The evergreen varieties, fir, tamarack, yellow and bull pine, predominate. On the lower benches and jutting points, juniper and mountain mahogany are quite plentiful.

The soil along the river and creek bottoms is a mixture of vegetable mold and sediment. It produces a variety of natural grasses, which make a fine quality of hay. These grasses are distinguished as bluejoint, sugar grass, and redtop.

The upland is thickly and firmly set with a hardy growth of bunch grass, affording both summer and winter range for stock. Eastern buyers and shippers of stock claim that no better beef-producing section exists than that afforded by our natural range, and for breeding and maturing cattle, sheep, and horses, it is unexcelled.

Cereals are grown almost anywhere, but more sucessfully along the streams affording water for irrigation. With proper facilities and cultivation, no failures occur, and crops are not particularly subject to insect pests. From 30 to 75 bushels of wheat is the average crop, and one field near Burns yielded 78 bushels of good, marketable wheat to the acre last year. Barley and rye are grown. The hardy fruits can be produced here to perfection. The products of the orchards are singularly free from defects caused by insect enemies. Shrub plants in great variety, adapted to both climate and soil, grow luxuriantly.

The soil is believed to be especially adapted for the successful growing of sugar-beet roots.

So far, the natural water-power of our rivers and creeks, though ample, has not been utilized. The lack of capital to develop our water supply and convey it by ditches to the irrigable lands is the most serious drawback to general farming in this country. Water for farming purposes can be obtained only from the streams heading in the mountains, or from a system of artesian wells. A vast amount of capital would be required to put either system into operation. The government should provide a system of storage reservoirs which would fill with water during the winter and spring months, and be of use to the farmers in the summer. It is thought that in this way 2,000,000 acres of sagebrush and bunchgrass land could be reclaimed. Another drawback is the utter absence of railways and waterways. Huntington, on the Oregon Railway and Navigation Company's line, is the most accessible shipping point. It is 160 miles from Burns.

Burns is the principal town and the county seat. During 1897 it doubled its population, and it is expected to pass the 1,000 mark this year. Other towns are Harney, which is located near old Fort Harney, of army and pioneer history ; Drewsey, Narrows, Diamond, and Lawen.

By reason of our great distance from the transportation routes and the unfavorable condition of our roads in winter, it is necessary for our merchants to carry large stocks through the winter. Notwithstanding the large capital invested in the merchandise, and the fact that the credit system prevails throughout the county, no failures were reported last year. All lines of business appear to be prosperous.

MALHEUR COUNTY.

By S. L. Payne, Westfall.

Location—Southeastern Oregon. The county is about 200 miles in extent form north end to the southern line of the state, having an average width of about 80 miles. It is watered by two main rivers—first, the Owyhee, which rises in the mountains of Nevada, enters this state a few miles north of the southeastern corner of the county, and flows in a northeasterly course at first and then curves sharply to the northeast till it joins the Snake river, 20 miles south of Ontario, traversing nearly 200 miles of its course in Malheur county, and furnishing, with its numerous tributaries, an immense volume of water for irrigating purposes. The next stream of importance is the Malheur river, which, rising in the mountains of Grant and Harney counties, joins forces near the western border of the county within about one third of its length of its northern-most limit, and flows east by north, emptying into the Snake river just north of Ontario. At present its valley has the greatest number of farms of any single stream in the county. Nearly all the land bordering our streams is of the very best, being generally covered in its wild state by a rank growth of sage brush and rye grass, and easily cleared.

Agriculture, though secondary to and generally an adjunct of stock raising, has made great advancement in the last few years, Malheur county producing this year (though we have no grist mill in the county, and not much attention being paid to raising it) 20,000 bushels of No. 1 wheat, averaging for the county 30 bushels per acre. Of barley, which is the principal grain crop, there were raised in 1897 about 75,000 bushels, averaging 45 bushels to the acre, and crops of 60 to 90 bushels to the acre have been threshed.

Of oats, to the raising of which not much attention is paid, 35,000 bushels were raised; potatoes, about 35,000 bushels—and probably no section can raise finer or better flavored "spuds" than does Malheur county, and the yield per acre is enormous; cabbage, melons, tomatoes, cucumbers and, in fact, all garden "sass," are raised to perfection, as regards quality and quantity.

Of hay, the greater part of which is alfalfa, there were put up in Malheur county about 45,000 tons, two and three crops of alfalfa being cut each season; and wild rye grass has been known to cut four tons of very nutritious hay per acre.

Of sheep, there are over 100,000 head in the county, producing over 800,000 pounds of wool. About 40,000 head of horses, 60,000 head of cattle, and about 30,000 pounds of butter and cheese were marketed the past season.

In the northwest corner of the county is embraced a spur of the Blue mountains, from which was cut last season about 500,000 feet of lumber; and there is a demand for and plenty of timber for other sawmills.

In the northern part of the county are located some of the oldest placer mining claims of Eastern Oregon; and those old camps, together with the new claims on Snake river for saving the fine gold of its bars and banks, produced last year about $150,000 worth of gold dust. Good quartz prospects are being opened in the northern part of the county. A fine quality of building stone is found in nearly all parts of the county.

The fall of nearly all the streams is such that we have practically an unlimited water power.

Fruit growing is, compatively speaking, yet in its infancy; this county produced last season about 10,000 bushels of apples, the quality of which is excelled by the apples of no section of the United States. Thus far the orchards are wonderfully free from the usual pests. Peaches, apricots, plums, and prunes are grown in abundance in those parts of the county settled long enough by those housebuilders who did not come hither solely in search of range for their stock, and who to start their homes right set out an orchard as one of their first steps.

One of the fine sections of the county is Jordan valley, in the southeast corner. It is watered by the Jordan river, which rises in the mountains of Idaho, near the great mining camps of Silver City and De Lamar, and flows in a westerly direction till it joins the Owyhee, running through a fine valley of farming land.

Numerous large ranches here are devoted to hay and stock, and the surplus grain produced here finds a ready market in the mines mentioned above.

The town of Jordan Valley is beautifully situated on the north bank of the stream, near the head of the valley. It has a fine school house, and usually nine months' school each year; two general stores, doing a flourishing business; blacksmith shop, wagon repair shop, and a good hotel. The population is about 400, and some of the residences would do credit to much larger towns.

There is still a large body of arable land on this stream and its tributaries to be brought under cultivation, which will be, as soon as the necessary capital is brought to bear to bring water to the land.

A daily mail runs by stage from Caldwell, Idaho, on the Oregon Short Line railroad to Jordan valley, and one from Jordan valley to De Lamar, Idaho; and a telephone line also connects the two places. Traveling north from Jordan valley, one passes through one of the finest stock ranges in the west (extending from the eastern line of the county to the breaks or bluffs of the Owyhee), interspersed with numerous small streams whose fertile valleys yield immense crops to the thrifty husbandman; and finally by a gradual descent one enters the valley of the Snake river, and after a ride of six or eight miles we come to the Owyhee settlement, which is on the river of the same name. This place would be a great surprise to the old pioneers who toiled over the old trail down the Snake river 35 or more years ago, or even the more recent travelers of a dozen or so years ago, for then the Owyhee valley was but a barren, sandy desert, where the sand was drifted into mounds around the grease-wood and sagebrush. Now it is covered with fine alfalfa fields, good orchards, fine houses, and all the evidences of a thrifty and prosperous community, with a good school and a well-built school house, and Divine services and Sunday school every Sabbath.

This might properly be termed a part of the Snake river valley, for, commencing a few miles south of the mouth of the Owyhee where the Oregon state line crosses the Snake river, thence running north along the west bank of the Snake river to near the north end of the county, is a vàlley nearly 75 miles in length by from 2 to 10 miles in width, from the river to the foothills; and no better body of land can be found anywhere. There is already quite a large settlement in this valley, and still there are thousands of acres lying idle. All kinds of fruits, as well as grain, vegetables, and alfalfa hay can be and are successfully grown here, and as soon as water from the Snake river and tributaries can be brought upon this land there will be a great increase in the number of farms and people in this valley. From the Owyhee, at the point where it leaves the hills and enters the valley, a ditch has been taken out that is 12 feet wide on the bottom and 18 feet at the top, with 3.32 fall — estimated to carry 12,000 inches of water. It extends to Ontario, and even to some of the farms in the lower part of Malheur river valley. Another ditch of about 4,000 inches capacity is taken out of Snake river, and is carried to Ontario and adjoining farms. But there is need of more water and ditches on the south side of the mouth of Malheur river, while on the north side of the same river most of the irrigating is done by means of wheels, raising the water from Snake river.

Ontario is located in about the central part of this valley, on the Oregon Short Line railroad, and is a lively town of about 500 population, with 3 general stores, a fine two-story, brick schoolhouse, a fine church, 2 hotels and 1 restaurant, 3 saloons, a blacksmith shop, 2 good livery barns, a harness shop and tin shop, and a well-stocked lumber yard. Ontario is the emporium of this and Harney county, and tons of merchandise are annually hauled by freighters with teams and wagons from here to the interior merchants, while the number of cars of cattle, sheep, wool, and horses shipped from this point would do credit to much larger towns. A daily stage runs from Ontario to Burns, Harney county.

Ontario is also the center of the fruit growing industry of the county, and a fine nursery and several fine fruit farms have been set out at Arcadia, 6 miles southwest of Ontario. Vale, the county seat of Malheur, is located about midway of the length of the fertile valley of the Malheur, which is about 40 miles long and has an average width of 6 miles, and is one of the productive valleys of Eastern Oregon. Vale has 2 general stores, 1 drug store, blacksmith shop, 2 saloons, 2 hotels, 2 livery stables, shoe shop, and 2 papers (the *Gazette*, the oldest paper in the county, and the *Advocate*), and a fine 2-story stone school building, built of native, light grey stone. The enterprising citizens of Vale have sunk an artesian well, and at a depth of 42 feet have struck a strong flow of hot water, which is thrown to the height of 35 feet in the air and will soon be piped all over town. They have also constructed a telephone line to Ontario, and during the present winter have built a flouring mill, roller process, capacity 50 barrels per day, to run by water power taken from the Malheur river, which will be ready to grind the wheat crop for 1898. The court house is a wood structure, having ample room for all the present needs of the county, with a separate fire-proof vault for the safe keeping of all records, deeds, etc.

The Malheur valley has quite a large population, and the farmers are all prosperous, as is evidenced by the improvements going forward in all directions; and there is still nearly as much unoccupied land in the valley of just as good quality as that which is farmed. This land is owned principally by the Willamette Valley and Cascades Wagon Road Company, and the Dalles and Boise Military Wagon Road Company, and can be purchased at reasonable prices. From the Malheur valley northwest to the northwest corner of the county, and then going south for a distance of 70 miles, will be found numerous small streams, with small fertile valleys along their course, supporting quite a population and producing all crops generally grown in the temperate zone, except corn, and that in some few places grows finely. By far the greater portion of this section, though, is composed of high ridges, in fact, almost mountains, covered with sagebrush and bunchgrass and furnishing an almost limitless range for all kinds of stock, which is the principal source of the income of the greater part of the present population. Towards the southern and southwestern corner of the county is also a great stock range, with large bodies of vacant land which would support a large population if some system of storage reservoirs or artesian wells can be instituted so that the land can be irrigated.

Taken altogether, Malheur county offers superior inducements to the intending settler. The stockman can find ranches surrounded by excellent ranges at reasonable prices; the horticulturist can find the best of land at very low prices with good water-right and a first-class climate for his chosen pursuit, and there is no better country anywhere for poultry raising. According to analysis of samples grown here, the country adjacent to Ontario produces sugar beets of a superior quality, carrying a very high per cent of sugar; and steps are being taken to procure a beet sugar plant, and also a large fruit drying and canning establishment.

Apiculture has made considerable advancement, some of the settlers keeping only a few stands of bees while others have from 50 to 300 colonies. Alfalfa is the principal honey source and bees are generally wintered on the summer stands with but very slight loss.

It is well also to add that on all the small streams alluded to above as supporting a fair population there are also organized school districts, and generally well built school houses, with terms of school from three to nine months in length, and usually divine service and Sunday school each Sabbath.

The winters usually not very severe considering our elevation above sea level, which averages between 3000 and 4000 feet. The average snow fall is about 10 inches. Most of the county is entirely free from cold, drifting winds in winter, the most annoyance from wind being a northwest wind for a few days some springs. Nights in summer are always cool enough to insure sound refreshing slumbers.

The gross valuation of all property in the county in 1897, as ascertained by the assessor, was $1,240,225.50 including $12\frac{53}{100}$ miles of railroad and $28\frac{51}{100}$ miles of telegraph and 'phone lines. There were found only 21,617 acres of cultivated land, and 316,068 acres cleared but uncultivated, about three fourths of it being susceptible of cultivation. As said before, there are still large tracts of government land open to settlement. Estimated population of county is 4500. Good cleared and improved farms can be bought at an average price of $18 per acre, while good farms not improved are held at $1.25 to $2.50 per acre.

As to health, will say there are only two physicians in the county, and they do not seem to be rushed by calls for their services. Malheur county will within the next two years have a railroad running through it from east to west, and it is learned that arrangements have been made for the completion of the old Oregon Pacific, (which was surveyed and work started upon several years ago,) which will give this countv easv connection with Portland or Corvallis and the ocean at Yaquina bay.

CROOK COUNTY.

J. A. Williamson in Oregonian, January 1, 1898.

Population	5,000
Acres under cultivation	32,109
Bushels of wheat	100,000
Bushels of oats	40,000
Bushels of barley and rye	50,000

Tons of hay	50,000
Bushels of corn	500
Pounds of butter and cheese	45,000
Bushels of potatoes	50,000
Bushels of apples	6,000
Bushels of prunes and plums	500
Ounces of gold dust	100
Feet of lumber	1,500,000
Pounds of wool	2,500,000
Number of sheep	320,000
Number of hogs	1,500
Number of horses	10,500
Number of mules	250
Number of cattle	40,000

Crook county is the hub around which Oregon revolves. At least, it embraces the geographical center of the state, and is noted for its pastoral wealth, producing at the present time more wool, beef, and mutton than any other county in Oregon.

West of us lie the Cascade mountains, the summit of which forms our western boundary. The slopes of the mountains fall eastward, and are covered with a growth of timber, principally yellow pine, which, together with the timber growth on the Lookout, Mowry, and McKay mountains, will some day make lumbering an industry of more than passing importance.

Irrigation will figure largely in our future development. Crook county ever has been, is now, and will ever remain essentially a stockraising county. Its rough and broken surface, composed mostly of what is termed waste land, together with its climate, fit it for the raising of stock and argue against its ever supporting a heavy population. Irrigation will perhaps double the number of inhabitants. Crook's timber will some time add to its industries the manufacture of lumber, with the attendant increase of population. But when all is said, stock will, in the future, as now, be our leading wealth producer. Through the agency of irrigation much of our sage lands will soon be reclaimed, and hay, grain, and vegetable growth enough will be obtained to add to our stockraising and stock-feeding facilities; which, in turn, will create a demand for, and a supply of transportation facilities in the way of one or more railroads, and thus enable us to fatten and market our own stock instead of passing this remunerative feature of the business into the hands of others, as we now do.

Where water for irrigation can be had, our sage lands produce an abundant yield of alfalfa and grain, a third crop of alfalfa not being uncommon. Vegetables of most varieties are produced in abundance, and fruit is now grown successfully all over the northern and central portions of the county.

It must be noted that the method of stockraising in this locality is gradually changing. The days of large herds of cattle dependent solely upon the natural grasses and handled only by the spring rodeo are gone. And while the largest growth of grass is also gone, especially in well-watered regions, more stock is now handled with less loss than under former methods. Through the rigorous winter weather cattle and sheep are now prepared for in the matter of feed. Winter feeding is now an essential and somewhat costly feature of the business, but with it come permanence and security.

The sentiment of "make a stake and get out of here" is fast giving way to home building and permanence. Gradually our prudent people, noting our healthful climate, the productiveness of our soils with even slight irrigation, the sureness of our supply of beef, wool, and mutton with moderate care, are building for themselves homes in which to settle down and live. School houses are now dotted here and there along the streams as permanent settlement advances, and it may be truthfully said that in the matter of early training our Crook county youth will compare favorably with the best.

I will make the statement, truthfully as I think, and without any pretense of booming the county, that Crook county has withstood the pressure of the recent hard times as well as any community on the Pacific coast. There have been fewer business failures, less enforced idleness and want than elsewhere. This statement of facts simply proves the assertion that a stock raising country is the best country on earth for a poor man.

With the present and prospective rise in price of both beef and mutton, nothing remains to hinder an era of unprecedented prosperity in Crook county for a number of years. The darkest spot upon our financial horizon at present is the proposed closing of the Cascade mountains to the pasturing of stock, which event, should it happen, will curtail our stock grazing privileges to such an extent as to entail a direct loss upon us difficult to estimate. And it is to be devoutly hoped that the present administration at Washington will thoroughly investigate the premises before taking final action in a matter so adversely affecting not Crook county alone, but almost the entire stock raising interests of the whole of Eastern Oregon.

GRANT COUNTY.

Hon. Phil. Metschan, in Oregonian January 1, 1898.

Population	4,136
Acres under cultivation	29,485
Bushels of wheat	54,201
Bushels of oats	20,554
Bushels of barley and rye	22,780
Tons of hay	82,096
Bushels of corn	500
Pounds of butter and cheese	85,070
Bushels of potatoes	50,000
Bushels of apples	25,000
Bushels of prunes and plums	1,000
Ounces of gold dust	10,000
Feet of lumber	400,000
Pounds of wool	2,000,000
Number of sheep	250,000
Number of hogs	10,000
Number of horses and mules	6,737
Number of cattle	183,961

Grant county, one of the largest counties in the state, is located in the eastern portion of the state. It has an area of 5,472 square miles, exceeding in size Connecticut, Rhode Island or Delaware, and larger than the two latter states combined. The county was originally organized in 1864, with an area of about 16,000 square miles, and an acreage of something like 10,156,000. It was divided by the legislative assembly of 1889 by the formation of Harney county from its southern portion, leaving Grant with an area of 3,375,680 acres. Among its chief industries might be mentioned those of stock raising, agriculture, and mining. While it has no direct railway communication with the outside world, Canyon City, the county seat, is within sixty miles of the terminus of the Sumpter Valley and Baker City railroad, with which point it is connected with a good mountain road, and a daily stage and mail service. The principal towns are Canyon City and Prairie City, both prominent mercantile points, in direct telephone connection with Baker City and Long Creek, with similar lines to Heppner and Pendleton.

Stock raising, at the present time, may be said to be the principal industry, that of cattle, horses, and sheep being the leading features. Extensive shipments are made annually to local and Eastern markets. The middle, northern, and western portions of the county are peculiarly adapted to the sheep industry, the wool grown therein demanding a larger price than that from any other county in this part of the state. This may be accounted for by reason of its being free from dirt and burrs. Cattle and horses are also raised very extensively, more attention being paid to the former industry at the present time.

Grant is a mountainous county. It is liberally interspersed with beautiful and fertile valleys. The elevated portions furnish an abundance of rich and nutritious grass for summer range, while the valleys produce sufficient hay to care for the many herds during the winter season. The John Day valley, the largest in the county, the Long Creek valley, and the Hamilton and North Fork settlements are all well filled with a prosperous and contented people, and in all of them the hardier vegetables and cereals are successfully cultivated. Sufficient wheat is grown for home consumption, and some of the flour is shipped to the adjoining counties of Harney and Malheur. Large quantities of flour could be made for export were means of transportation convenient. Barley, oats, alfalfa, and timothy are all raised in quantities sufficient to supply the home market. All are grown to perfection, and with irrigation they produce excellent returns.

The John Day valley, as well as other localities in the county, is very prolific in the growth of fruits. All varieties of apples, and especially the hardier winter apples, are grown with great success, and for soundness and flavor they are unexcelled by those grown in any other section of the state. As a proof of their superiority it need only be stated that thousands of bushels of Grant county apples are annually hauled by teams to the nearest railroad point, and from there shipped to the markets of the East and West, where they find ready sale at good prices. Plums, prunes, and pears, as well as all varieties of small fruits, are grown with success.

The county is rich in precious metals, and although the mines have been almost steadily worked since 1862, gold is still produced in paying quantities. The richest mining districts at present are Granite creek, Greenhorn and Elk creek, in each of which placer mining is being carried forward during the seasons that water is abundant. In addition to these, many quartz lodes are being worked with flattering success. In the Granite district the Monumental and La Bellevue claims, both very rich in silver, have been successfully worked for many years. Gold placer mining is still being carried on very successfully in Canyon creek, which in the early '60s was recognized as the richest mining camp in the Northwest territory.

The John Day valley is provided with 2 modern flouring mills, and Long creek with another. These mills produce a superior brand of flour. Canyon City boasts of 1 brewery and a machine shop.

The county possesses many advantages which cannot fail to attract the attention of homeseekers, and when, in the near future, railways are constructed, bringing the county into more direct communication with the markets of the world, it is safe to say that the natural fertility of the soil, the mining resources, the all but boundless cattle and sheep ranges, will reflect credit upon the state at large, and Grant county's hills and valleys will be thickly populated with a happy, prosperous, and contented people.

BAKER COUNTY

By Hon. George Chandler.

The Klondike of Oregon is located on the eastern border of the state, and contains about 1,800,000 acres. It is crossed by the Oregon Railway and Navigation Company's railroad, connecting with the Oregon Short Line, and the Union Pacific. This county is in the midst of one of the richest mineral belts on the Pacific coast. Its surface is mountainous, but contains some exceedingly fertile valleys, of which Powder river valley is the largest. These valleys and mountains make this county a stockman's paradise. The foothills and mountains furnish excellent pasturage in the summer, while in the valleys large quantities of hay are produced for winter. The central part of the county is known as Powder river valley, and is devoted to farming and stock raising. The elevation being about 3,000 feet, retards agriculture somewhat, yet there is an abundance of wheat and other grains produced, and the soil yields well. Along Snake river, where the low land is protected by high mountains, and in all the sheltered valleys, the orcharding interests are quite extensive and profitable. Vegetables of all kinds are grown satisfactorily. The climate is mild, dry, and healthful. The chief industries are gold mining, agriculture, stock raising, lumbering, lime, and wool, each extensive and valuable, as may be seen by referring to the summary below.

The following account of the minerals and other resources of Baker county is furnished by the eminent statistician, F. R. Mellis, and was published in the New Year's Oregonian, for 1898:—

THE GOLD BELT OF BAKER COUNTY.—VIRTUE DISTRICT.

What is known as the free-gold section of Baker county is situated directly east of Baker City. The Virtue mine, around which hundreds of mines and locations are clustered, has a world-wide reputation for furnishing the richest and most beautiful gold specimens in the universe. One of the now celebrated "pockets," which are frequently encountered in this wonderful property, yielded $70,000 last year, and the regular ledges, which have attained a depth of 800 feet, show no relaxation of values, but on the contrary, keep on improving. The annual output of this property is $250,000. The Flagstaff is a recently developed mine, fully equipped, and produces about $100,000 per annum. The Consolidated Virginia, adjoining the Virtue, encountered the Virtue ledge recently at a depth of 500 feet, and active preparations for one of the most complete mining plants in the state are now under way by Messrs. Keith and Bamberger, the controlling owners. The Rachel, incorporated as the Gold Ring Mining Company, struck water at a vertical depth of 400 feet. A splendid showing of valuable ore is made at the deepest workings, and the property will soon be in full blast. The Gordon has lately been sold to Minneapolis parties, with the purpose of fully opening up the mine. The Perry, Climax, and Cliff have changed hands with the same object in view. Not quite so far advanced, but fully as promising, are the Emma, Montie, Friday, Brazos, Mabel, Cyclone, Red Jacket, Queen Bee, Sound Money, Paymaster, Wonder, Sleeping Beauty, Uncle Sam, Mogul, Amador, Collateral, Uncle Dan, Kearsarge, Columbia, and hundreds of other more or less developed claims.

BAISLEY-ELKHORN DISTRICT.

Sixteen miles northwest of Baker City is located the Baisley-Elkhorn district. The veins run north and south, formation principally slate, and the free-milling value of the ores is 40%; balance of values is saved in concentrates containing a great deal of massive sulphide ore. These concentrates average about $65 to the ton, and all the properties in the district have a considerable amount of shipping ore. Most prominent among the producers of this district is the Baisley-Elkhorn, situated at the head of Pine creek, at an altitude of 6,500 feet. The present management, under the ownership of the Eastern Gold Mining Company, is now engaged in fully opening up the property. The two 20-ton Bryan mills, with their 40-ton daily crushing capacity, yield, when fully employed, $125,000 per annum. Other important locations are: The Sherman group of seven claims, Bonanza-Elkhorn, Hurdy Gurdy, Denny group, Robbins-Elkhorn, Dolcouth, Gladstone, and a number of producing placer mines.

ROCK CREEK DISTRICT.

Directly west and across the ridge from the Baisley-Elkhorn, commences the Rock creek district, formation of ledges and character remaining about the same. The district includes the mountain region between Baisley-Elkhorn and Cracker creek, covering a distance of 6 miles. On nearing the Cracker creek belt, the ore becomes entirely base. The most important work in this section is prosecuted on the Maxwell group, owned by the Maxwell Gold Mining Company. Developments in the way of tunnels aggregate over 2,000 feet, and ledges from 3 to 4 feet in width have been uncovered in many places, showing values from $2 to $65 per ton. There is a ten-stamp mill belonging to this property. A little further on is the Chloride, also well advanced and opened up. Ore shipped from this property give smelter returns of $60 per ton. Other promising propositions are: The Clipper, Kelley, and Foft, Badger, Gopher, Nellie Grey, Knapp's mine (recently sold to J. B. Risque, and showing a twelve-foot ledge of high grade ore), McArdle claim, and probably 50 other locations.

CRACKER CREEK DISTRICT.

West of Baker City is the Cracker creek section, with veins running north and south. They are imbedded in a shale slate. The ore is base, requiring concentrating, smelting, or cyanide extraction, as the case may be. The district is 4 miles wide and 18 miles long, contains mammouth bodies of ore, and has excellent mining facilities in the way of water, fuel and timber. The Eureka and Excelsior produces $250,000 per annum, the North Pole $150,000, and the Columbia $125,000. The Esmeralda group (recently bonded by a Montana syndicate) is apt to prove a surprise to the many investors who had a chance at that property. A prospecting mill and concentrator are being put on the ground at the present time. Among the other notable properties of that district, with ledges from 5 to 105 feet, may be mentioned the following: Ohio, Climax, Appomattox, Golconda, Wild West, Amazon, Bunker Hill, Nine Strike, North Star, Middleman, Mountain Belle, and Golden Treasure. South of this belt is the Ibex group of mines, that are being extensively developed. The Ibex proper shows specimens of ore containing gold, ruby silver, cinnabar, and tellurium. The Mammouth is a property that has produced largely in the past, and will eclipse its former record as soon as reopened.

CABLE COVE DISTRICT.

Still further west of Baker City is the Cable Cove district, the ores of which are enclosed by porphyritic granite, which contacts with the Eureka and Excelsior slate formation on the east, and with gneiss on the west side. The ores from this district are principally concentrating and smelting, interspersed with free gold quartz on the surface. The veins run north and south, and are parallel with that of the Eureka and Excelsior, the belt embracing four miles in width and twenty miles in length. The California (now the Gold Star Mining and Milling Company) has a 10-stamp mill, and Knox's 5-stamp mill does custom work. Other properties with a bright future before them are the Mormon Boy, from which carloads of ore worth $400 per ton are shipped; the Sunset Davenport, Ivy, May, Herculean, Oregon Chief, Homestake, McKinley, Baker City, Overland, Portland, Winchester, Grey Eagle, Miner, Black Dwarf, Anaconda, Cable Cove, Confidence, Crown Point, Star, Gold Standard, Snow Shoe, Jersey, Rob Roy, and Midnight.

BONANZA DISTRICT.

Southwest about forty miles from Baker City, commences the celebrated Bonanza district, containing east and west veins, with formation of talco slate. The character of the ore, as far as developed, is principally free-milling, 70% of the values being saved on the plates; balance—sulphurets, yielding concentrates valued at between $70 and $100 per ton. The producing capacity of this rich mineral section is simply incalculable, the ledges in some instances, as in the case of the Bonanza, forming a solid wall of forty feet of ore, valued at $27 per ton. The fame of this property has spread far and wide, it alone adding $800,000 annually to the wealth of Oregon. Preparations for a 100-stamp mill are now under headway. The Don Juan, with a 10-stamp mill, produces $60,000 per annum, and every 100 pound sack of ore dug out of the Pyx is worth $200. The other mines rapidly forging to the front are: The Virginia, Belcher (group of seven claims), Diadem, Phoenix, Imperial, Golden Gate, Worley (now the Greenhorn), Richmond, Watson, Crown Point, Ramshorn, Aerial, Lucky Boy, Banzett, Blackbird, Haggard, Haggard West, Cleopatra, Emma, Monarch, Independence, and Pacific. A test run on the Pyx mine of 28 tons netted $105 to the ton.

GOLD RIDGE DISTRICT.

Very rich tellurium ore is found in this range of mountains, the Gold Ridge and Gold Hill being the two most noted mines in the section. Keith and Bamberger, of Salt Lake, own the Gold Ridge, and are operating with a 10-stamp mill, producing about $100,000 per annum. The Gold Hill is in charge of Colonel James A. Panting, who is now making arrangements for a cyanide plant, in order to save a larger percentage of the big values contained in the ore. A recent 35-pound specimen from the 85-foot level assayed $212 per ton. the ledge averaging about 4 feet. The output from the Gold Hill is between $90,000 and $100,000 per annum. The district is located about 35 miles southeast from Baker City. It contains many producing placer mines, in addition to the quartz properties. Worthy of mention in this connection are the Sisley placers, Bohna, Chicken Creek, Hogback, Gallagher, True Blue, Woods Company, Capay, Lost Basin, Durkee, Bricheaux, and the Hall opal mines adjoining the Gold Hill, and employing 15 men at present.

RYE VALLEY DISTRICT.

Forty miles southwest of Baker City is the Rye Valley district The formation is granite, the veins small, but exceedingly rich, milling as high as $100 per ton in free gold. The ledges run east and west. A three-stamp mill on the Macedonia gives excellent results, but the principal value is obtained from the auriferous placer mines, lavishly distributed throughout the basin. Operated and in course of development are the following claims: Humboldt, Littigs, Romeo, Julietta, Bulldog, Herculean, Leilla, Odell, Seguin, Cincinnati, and others.

Other valuable minerals in the county are coal (Auburn district), immense deposits of gypsum near Huntington, big ledges of antimony in the Virtue district, and in the neighborhood of Express; opals in Hall brother's mine; kaolin (decomposed mineral feldspa for manufacture of porcelain, covering miles of territory near Huntington, and vast quantities of copper, lead, and iron on Powder river.

SUMMARY.

According to information furnished by bank and courthouse officials, and other reliable sources, the following constituted the principal items of Baker county's natural resources for the year of 1897:—

Product.	*Quantity.*	*Value.*	*Amount.*
Gold, ounces	100,000	$ 20 00	$ 2,000,000
Wheat, bushels	200,000	60	120,000
Oats, bushels	150,000	40	60,000
Barley and rye, bushels	80,000	50	40,000
Hay, tons	50,000	3 00	150,000
Butter and cheese, pounds	100,000	20	20,000
Potatoes, sacks	200,000	40	80,000
Apples, pears, peaches, grapes, prunes, and plums, bushels	100,000	50	50,000
Lumber, feet	30,000,000	7 00	210,000
Wool, pounds	600,000	10	60,000
Sheep, head	70,000	2 50	175,000
Hogs, head	10,000	6 00	60,000
Horses, head	10,000	5 00	50,000
Cattle, head	30,000	20 00	600,000
Total value			$ 3,675,000

The census of 1895 credits Baker county with a population of 6,061. There has been a large increase since then, and the present population is estimated by some as high as 12,000. Taking this figure for granted, the soil alone has earned $306.25, in 1897, for every man, woman, and child living within the boundaries of Baker county, Oregon.

Gold output from Baker county, Oregon, quartz mines during 1897:—

Bonanza, Bonanza district	$ 300,000
Virtue mine, Virtue district	250,000
Eureka and Excelsior, Cracker Creek district	225,000
North Pole, Cracker Creek district	120,000
Columbia, Cracker Creek district	110,000
Flagstaff, Virtue district	90,000
Gold Ridge, Gold Ridge district	70,000
Baisley-Elkhorn, Baisley-Elkhorn district	60,000
Gold Hill, Gold Ridge district	60,000

Don Juan, Bonanza district	50,000
Humboldt, Rye Valley district	15,000
Pyx, Bonanza district	12,500
Gallagher, Lookout district	10,000
Ibex, Mammoth district	9,000
Rattler, Virtue district	5,000
Leonard, Rye Valley district	4,000
Smith, Rye Valley district	3,500
Friday, Virtue district	3,000
Ninety-Seven, Cable Cove district	2,500
Martin Hill, Weatherby district	2,500
Rachel, Virtue district	2,500
Columbian, Virtue district	2,000
Tom Paine, Pocahontas district	1,500
Perry, Virtue district	1,500
Climax, Cracker Creek district	1,500
Uncle Dan, Virtue district	1,000
Cyclone, Virtue district	600
Kearsarge, Virtue district	400
Total	$1,413,000

Gold output from Baker county, Oregon, **placer mines during 1897:**—

Gold deposited in First National bank	$ 172,000
Gold shipped through Baker City postoffice	150,000
Gold shipped via Baker City express office	150,000
Gold shipped from Huntington to Boise direct	100,000
Gold shipped from Rye Valley to Boise direct	25,000
Gold shipped from Express to Boise direct	15,000
Gold shipped from Weatherby to Boise direct	10,000
Total	$ 622,000

RECAPITULATION.

Total gold output from quartz mines	$1,413,000
Total gold output from placer mines	622,000
Grand total	$2,035,000

Baker City is located at the southern end of Powder river valley, where the Oregon Railroad and Navigation Company's railway crosses Powder river, and has a population of more than 6,000. There is an enrollment of over 1,000 pupils in the public schools. Two large school buildings, one of brick, costing $30,000, and the other of wood, comfortably accommodate them. Excellent teachers are employed, and the schools are kept open nine months of the year. Most of the leading religious denominations are represented, and their places of worship are elegant structures. Three newspapers flourish, two dailies and one weekly. It is the county seat and the principal town, and has the largest volume of business of any town in the state, barring Portland. The reasons are obvious: First. It has within its corporate limits one of the largest sawmills and finished lumber manufacturing plants to be found inland on the coast. The logs for this immense business are supplied by means of a railroad running 30 miles up Powder river, to where an almost inexhaustible supply of fine yellow pine, tamarack, and fir timber is found. Second. It is a supply point for the immense and rich mining country heretofore described, and the point from which are shipped to eastern and other markets large numbers of cattle, horses, sheep, hogs, mineral and agricultural products. Baker City is provided with good water works, an electric light plant, gas works, an efficient fire department, good hotels, mercantile establishments, and two national banks.

WASCO COUNTY.

By The Dalles Commercial Club.

Wasco county is situated on the north boundary of the state. Commencing in the grand cañon of the Columbia, where that river cuts its way through the main range of the Cascade mountains and at a point on the line of the summit of that range, it extends eastward about 66 miles to the mouth of the Deschutes river. Its eastern boundary line follows that river up for about 30 miles in a southerly direction, thence again easterly to the John Day river, which marks its eastern boundary the balance of the way; thence due west to the summit of the main Cascade range, which it follows northerly to the place of beginning. It contains about 4,000 square miles. The western half of the county is heavily timbered, yellow and red fir, hemlock and pine prevailing in the order named. This timber is of fine quality, the forests so far untouched, and will some day prove a source of vast wealth. At present, however, it is used only to the extent of supplying the local markets, if we except one mill located at Hood river, which cuts some 7,000,000 feet a year in the shape of ties for the Oregon Railway and Navigation Company.

Owing to its situation on the eastern side of the mountains, the surface of the county has a general slope to the east. The long ridges, covered with timber, slope gradually down, until near the center of the county the timber gives place to bare hills, which in turn soon melt imperceptibly into the high-rolling prairies of Eastern Oregon. The northern portion of the county slopes to the north, its drainage being into the Columbia. If you will take a glance at the maps of Oregon and Washington you will take notice that the Cascade range, extending through both states and parallel to the coast line, presents an almost impassable barrier between the eastern and western portions of those states, and glancing along its line in Oregon you will see that no railroad as yet crosses its summit within the state. You will see from this, further, that the natural outlet of Eastern Oregon, or the Inland Empire, as it is familiarly called here, is the Columbia river. The products of the country must find the markets of the world either by being hauled clear across the continent, or by finding a nearer market only 100 or 200 miles away down the Columbia, where our wheat, wool and other products reach tide water, and thence by the cheapest transportation—the deep sea ships—to the world's markets.

SOIL AND CROPS.

The northwestern portion of the United States, and a large portion of British Columbia, were at one time subjected to a tremendous overflow of lava, and in consequence the mountain ranges are composed of basalt, while the prairies of Eastern Oregon and Washington have that same material for a foundation. It is the greatest mass of basalt in the known globe. Following this, the country between the Rocky mountains and the Cascades, or their continuation, the Sierra Nevadas, was covered by a vast inland sea, and the soil of this region therefore is sedimentary, consisting largely of decomposed basalt. On this account it is exceedingly rich in plant food, and its wearing qualities are unexcelled. It will stand recropping to cereals longer than any other, and is in this respect practically inexhaustible. It yields generously, even to the slipshod methods of farming to which much of it is subjected; and while not every crop is the best, such a thing as a total failure is unknown. It retains moisture well, and good crops of wheat can be, and in some years have been, grown without seeing a drop of rain from the time the seed was sown until the grain was harvested.

Everything that can be grown in the temperature zone will do well here, though, in common with most of the Pacific coast, corn is not raised extensively on account of the coolness of the nights. Wheat, oats, barley, potatoes, and vegetables of all kinds do well and yield abundantly. The staple crop of the country has been, and for that matter is yet, wheat, which was raised in large quantities, and which found its markets in Europe, going by way of the Horn. Until recently this was depended upon by the farmers as the sum total of farming. During late years the extremely low prices for wheat changed this, and the farmers have found that putting their wheat into hogs and cattle is far more profitable than shipping it. Growing the wheat can be done at trifling expense, and, in fact, it can be put in the stack or barn ready for feeding at a less price per bushel than corn. Heretofore farmers have shipped wheat and imported bacon and other hog products; now the grain fields of Wasco are not only supplying the local demand in this line, but the surplus is finding a market in Omaha and Chicago. Wheat proves profitable as hog feed so long as the price is below 60 cents per bushel. Last year, for a while, it was over 80 cents, and consequently the bulk was sold to the market, in many instances netting the producer more by a third than he considered the land worth upon which it was grown. Good wheat land is valued at from $10 to $15 per acre. Potatoes are a sure crop, and yield well, and though raised only to meet the local demand, a call from the East met with response here, and some 15 carloads were shipped this spring. Onions, lettuce, and radishes grown in the open air were in the markets early in March, and in abundance. Oats, barley, and rye all do well, but are not raised in quantities larger than will supply the local market, except such as is cut when in the milk for hay, and they are used almost universally for that purpose.

LIVESTOCK.

In the earlier settlement of the country it was devoted entirely to stock raising, the prairies and hillsides being covered with a luxurious growth of bunch grass, which gave sustenance to vast herds of cattle and horses. For several years that was the sole industry, and the idea prevailed that the land would not grow anything; but as experiments showed that it was a prolific and unfailing soil, the bunch grass lands began to be turned into wheat fields. In spite of this, however, the stock industry is the leading one of Eastern Oregon, and is a very important one in Wasco county. The sloping hillsides are covered with cattle, and when a certain distance from the river is reached (usually about 20 miles) the lands are still devoted to stock raising on account of the expense of hauling farm products to market. While the exact figures are not attainable, a conservative estimate of the number of cattle shipped from this point each year shows that the grand total reaches the handsome sum of 206 carloads, or about 5,500 head. To this should be added 220 carloads of sheep and 60 of hogs. It is estimated that the cattle and sheep shipped annually from the country tributary to The Dalles, will amount to 20,000 of the former and more than 200,000 of the latter, many being driven to market. Thousands of our sheep are driven to Reno, Nevada, and from that point are shipped to the San Francisco markets. The figures this year show that the county has 123,529 sheep, and besides this Crook county, lying to the south of us, has more than twice as many, and both the increase and wool from these vast flocks find their market at The Dalles. In the summer these flocks find fresh and abundant pastures in the Cascade mountains, running in bands of from 1,500 to 3,000, and as soon as the shearing season is over they are started for the mountains, following the grass up, as the season opens, often being close to the retreating snows, and only stopping at the line of perpetual snow on Hood, Jefferson, and the other great peaks. In the fall they feed down the mountains again, nipping the tender grasses started by the fall rains, and arriving at winter quarters in fine condition. The raising of horses is being abandoned, owing to the low price.

WOOL.

It is hard to estimate the amount of wool grown in this county, for that from Morrow, Grant, and Crook counties finds market at The Dalles, Wasco's county seat, and considerable comes from Klickitat county, Washington, on the north. The Dalles is the greatest wool shipping point in the United States; that is, there is more wool gathered here from first hands. The amounts will run from 7,000,000 to 8,200,000 pounds.

FISH.

Our fishing industry is a large one, and the amount of money made at it, under favorable circumstances, is large. There are two modes of fishing on the middle Columbia—one the usual one followed elsewhere, the gill net, and the other peculiar tô the location, and admissible only where there is a good current. The latter is by what is known as the fish wheels, and these in turn are divided into two kinds, the stationary and the scow wheel. The scow wheels are generally anchored at some point at the head of an eddy, where the salmon seek to avoid the current. The amount of fish they will catch in a day, with a good run, is almost beyond belief. The stationary fish wheel works on the same principle as the scow wheel, but being built on the bank where it is exposed at high water to a tremendous current, is a much more expensive matter, costing from $3,000 to $7,000, while the scow wheel costs from $500 to $1,000. Some of the stationary wheels have been known to catch as high as 50 tons of fish on a day. As salmon bring from three to four cents a pound, it will readily be seen that a successful run means a fortune.

There are three canneries in the county where the salmon are preserved—one at Seufert's, 8 miles east of The Dalles; one at Tumwater, 12 miles east of us, and the other in the city—all profitable investments. Generally many carloads are sent east in refrigerator cars, and sold fresh in the eastern cities. The sturgeon fisheries, although on a much smaller scale, yield considerable revenue. The Columbia sturgeon grow to immense size, an 800 pound fish being no great rarity, and 1,100 pounds being sometimes reached. The latter business requires no capital, but a boat and lines, probably $100. Of recent years the sturgeon has been bringing better prices than salmon, and during the season last fall and winter, some of the fishermen averaged $20 per day.

POPULATION AND VALUES.

The population of the county is 16,000. The Dalles, the county seat, is a pretty little city of about 4,000 inhabitants, and is one of the best and thriftiest business points in the state. It has 1 national bank, and 1 private one, with plenty of capital; 4 commodious hotels; 3 newspapers, *The Dalles Chronicle*, daily and semi-weekly, the *Times-Mountaineer*, daily and weekly, and the *Baptist Sentinel*, weekly. It has a gravity system of water works costing $125,000, the water supply being taken from a mountain stream 25 miles away and from a point near the glaciers of Mt. Hood. No better or purer water is furnished any city in the world, and its source near the snow line guarantees its freedom from future pollution. Its stores are the finest in the state, outside the city of Portland, some of them carrying stocks of goods valued at $75,000 to $100,000. A steamboat line, owned by citizens of The Dalles, plies the Columbia daily to Portland. Although we have excellent train service, this line of boats serves to keep both passenger and freight rates at a minimum, giving The Dalles cheaper rates, proportioned to distance, than any other point on the river, and putting her in position to control a large interior trade.

The county has a fine brick court house, costing $30,000. It has a debt of $43,000. The tax rate, county and state, varies from 18 to 21 mills. Its roads are good, and solid and substantial bridges are provided wherever necessary on the same. The assessed valuation of the county, made on or about a 40% basis, is $3,242,000; but this will be largely increased in the near future, owing to the issuing of patents to lands recently forfeited from the Northern Pacific railroad, and which consisted of every odd section for a distance of 40 miles back from the river and the full length of the county. These lands were non-taxable, as long as they remained unforfeited. There is a large area of government lands subject to homestead, but of course they are some distance back from the river. The United States land office is located here, a source of great convenience to intending settlers.

THE FRUIT BELT.

The wool and salmon industries yield annually from $750,000 to $1,000,000. The stock shipments, which include, of course, the country south of us and not in this county, will amount to $800,000 more, and our wheat will swell this to a grand total of $1,500,000. Yet notwithstanding the vast total, the fact is plain that in a few years one other industry, at present in its infancy, but growing, will yield a revenue greater than that from all other sources combined. That is the fruit industry. Wasco county, although only a few years ago not ranked as a fruit producer, stands today confessedly the best fruit county in the state. The climate and rainfall are perfect for the growing of winter apples, and this fruit will eventually place her in the front rank financially.

The western boundary of the county being, as we have stated, the summit of the Cascade mountains, it is also the limit of the excessive rainfall of Oregon, which commences to decrease at that point, and by the time the agricultural portion of the county is reached it is just right. Commencing at the Hood river valley, which opens to the Columbia, 22 miles west of The Dalles, and which is one of the best known fruit sections of the state, the fruit belt extends to the east along the Columbia river, and as the mountains give place to the prairies, follows around the foothills to the south, and extends across the county to the Deschutes river. Apple trees generally bear in from four to six years, according to variety, and the kitchen orchards, about all that were planted until a few years ago, have never been known to fail of a crop in the thirty years since the first were planted. The crop is sure, and the market in the United States for winter apples has never yet been over-supplied. Orchard lands are cheap in the wild state, the principal cost being in preparing them for cultivation. They will run in value from $2.50 to $50 per acre, according to amount of improvements, location, distance from market, etc. The trees are generally set about 108 to the acre, and are carefully cultivated, potatoes and other crops being raised between the rows.

It is only within the past five or six years that orchards were begun to be planted for other purposes than to supply the home demand. Then some small orchards were set with a view to making fruit-growing a business instead of a side issue. It was begun at first on a small scale, a few acres being planted at a time; but the idea gained ground, as a few of these smaller orchards began to bring in handsome returns, until now young orchards of 20, 30, and 40 acres are not uncommon. All varieties of apples do well. Pears are a certain crop, yielding abundantly, and the Bartletts are superior in color and flavor to any California ever produced. Prunes will also soon prove an important crop, many young orchards now growing being planted after experiments had demonstrated that they yielded well and were finely flavored. Plums and cherries are both certain crops, and the trees bear enormously. The same statement can be made concerning peaches, which grow to perfection and are always plentiful.

All small fruits do well here, and the strawberry is quite an important one, not less than $50,000 worth being sold annually. Hood River and Mosier are as yet the principal points at which they are raised, both being on the line of the railroad, a necessary condition to the shipment of this tender fruit. The variety grown for shipment, and which is the most perfect berry in the world, is the Clark's Seedling. It is a deep red, highly epauletted, solid to the core, and a phenomenal shipper, this latter quality giving it its principal value. These berries find their market in the mining towns of Montana, Denver, and in Kansas City and other far eastern points. At the Columbian Exposition at Chicago, the Clark's Seedling, grown here, took the premium over all other berries, even though they had been 4 days in an express car and had traveled 2,000 miles. They bring good prices, too, and this summer many of the patches yielded $400 to $500 an acre, net. In fact, this is about the net profit depended upon for this crop, and has been about the average return since the industry was first started. The first berry shipments were made from Hood River to Montana points in 1889, being simply an experiment. The returns were so flattering that a few small patches were planted, and in 1890 a few hundred crates, of 24 pounds each, were shipped. Last summer the total shipments were about 18,000 crates, which brought at the shipping point an average of $3 per crate. The lowest price realized was about 9 cents per pound, and in the beginning of the season they sold at from 30 to 50 cents a pound. When the shipments reached 2,000 crates a year, growers began to fear the market would be overstocked, and hesitated about enlarging their patches. They could not understand where all the berries went, nor that their berries would stand shipment to such markets as now take them. This accounts for the comparatively slow rate of increase in shipments; but last spring, when 16,000 cases were shipped, and as much as 2 carloads were being sent out every day, and on top of this telegrams from Omaha, Kansas City, St. Paul, and Chicago were demanding them in carload lots, the possibilities of the market began to be realized. The fall of 1897 the area in this delicious berry was more than doubled, and next year it will bring into the county not less than $100,000.

The fruit belt, as we have previously stated, is of large area, and the soil is divided into two distinct and widely-varying classes. The larger area is a dark brown loam, composed of decomposed basalt, and is from 10 to 50 feet in depth, the latter being not uncommon at the foot of some of the slopes. This soil holds moisture well, and grows all kinds of fruit without irrigation. The other is the very sandy soil along the Columbia. These require fertilizers and irrigation, but are somewhat earlier with their crops. One of the most notable of the orchards on this class of lands is that owned by the Seufert Brothers, and situate on the banks of the Columbia, 2 miles east of The Dalles. It consists of cherries, prunes, pears, and peaches, and contains about 40 acres. Ten years ago it was a barren sand flat; but for 6 years it has been bearing abundantly and yielding handsome returns. The cherries are particularly fine, and the peaches will equal in size anything California ever produced, and in flavor, rival those of New Jersey and Delaware. That 40 acres of land 10 years ago was worth $40, but $40.000 would be a modest sum for it now.

TRANSPORTATION FACILITIES.

One of the most vital questions to every community is its transportation facilities. Wasco county has settled that. Up to three years ago the only transportation company was the Oregon Railway and Navigation Company, operating a line down the south bank of the Columbia. Fourty-four miles below The Dalles this great river is obstructed by impassable rapids, there being a fall of 26 feet in a quarter of a mile. As the Oregon Railway and Navigation Company had no opposition, both freight and passenger rates were high. Owing to this, a corporation was formed known as The Dalles, Portland and Astoria Navigation Company, which put a fine steamer on the middle Columbia, plying in connection with the Dalles City, a fine boat on the lower river, and making the round trip daily. Of course there was a transfer to be made, but the state generously stepped in and constructed a portage railroad about three quarters of a mile long, so that freight could be transferred cheaply and quickly. As a result freight rates were reduced one half and passenger rates almost as much.

The government several years ago began the construction of a canal and locks to overcome the obstructions, which are now completed, and we have open river to the sea. These locks have cost $3,500,000, and are pronounced by engineers the finest piece of work of the kind in the United States. Their completion results in making The Dalles a "terminal point," giving us the benefit of through rates from the East, and thus puts our city in a position to compete with Portland for the wholesale trade of a large territory. At the same time it gives us still lower rates on our wheat and other products to the seaboard. The Dalles is now the best market of any place in Eastern Oregon. Wheat brings 10 cents more a bushel, simply because the freight rates are that much lower, owing to the opposition line of boats.

WATER POWER.

Wasco county has unlimited water power; not to speak of the rapids of the Columbia, which have a fall of 70 feet in 9 miles, ending 3 miles east of us; but which would require considerable capital to control. Deschutes river, a fine river 200 miles long, which drains the eastern slope of the Cascades, has a rapid fall, and Hood river, a stream rising in the glaciers of Mount Hood, falls 6,000 feet in 30 miles, and for the last 12 miles of its course falls 75 feet to the mile, and is of volume sufficient to furnish 2,500 horse-power for each 20 feet fall. These streams will eventually be used to bring the timber from the mountains, and at the same time will furnish the power to manufacture it into lumber. And while speaking of the timber, it may not be out of place to add that the immense forests of hemlock on the heads of these streams will furnish unlimited quantities of bark for tanning purposes.

MANUFACTORIES.

The immense amount of wool received here naturally suggests that it would be a fine place for a scouring mill, which it undoubtedly would; and this is an industry that will soon be established here, as the opportunity is too good to long remain open. There is, besides, room for numerous other factories. A woolen mill ought to have been running long ago. We already have a fine roller mill, producing 100 barrels of flour daily, if run to its full capacity; but there is room for more, as the supply of wheat is unlimited and the local market utilizes the bran and shorts. A cannery is another necessity, to use up the surplus fruits and vegetables; and a soap factory would find plenty of material and a good market. We have a fine meat packing establishment, its products ranking high and not beginning to supply the demand.

A flume from the mountains brings a large portion of the wood supply and lumber for the local market. At its head are vast forests of hemlock, the bark of which is the very finest for tanning purposes; and as there are hundreds of dry hides shipped from here East and brought back again in the shape of manufactured products, it is evident that a tannery, and with it a shoe and harness factory, would be profitable investments. Indeed, the field is a promising one, and the above are only suggestions in the line of what might be done here.

SCHOOLS AND CHURCHES.

Our educational facilities are good, the public schools ranking with those of any city in the state. We have in The Dalles 1,240 children of school age, an average attendance of about 800, and 16 teachers are employed. The city owns two fine brick school houses and three wooden ones. Besides these the Catholics have here a fine boarding school for girls.

The religious denominations are well represented. The Congregationalists, Christians, Methodists, Episcopalians, Catholics and Lutherans all have fine church buildings, and the Baptists, two. In these lines the city is ahead rather than behind the great majority of cities of its size.

CLIMATE.

The climate is delightful, the seasons being distinctly marked, but running neither to the extremes of heat nor cold. The west wind, sweeping down over the Cascades, reaches us laden with the odor of cedar and pine, making it of peculiar benefit to those who are troubled with weak lungs. Generally the climate is considered a remarkably healthful one.

TEMPERATURE.

The climate is equable for the latitude, the thermometer seldom going below zero or above 94. In either case the extremes are very short. Our extreme cold weather seldom lasts more than three or four days, and the same may be said of the heat. The reason for this is the prevailing west winds coming from the warm Japan gulf current, and familiarly known here as "Chinook winds." In the summer this wind is moist and cool, and blows almost steadily a gentle breeze, full of moisture, and beneficial to all vegetation, almost taking the place of rain. In winter it is comparatively a warm wind, cutting the snow rapidly, preventing any long period of cold. There is little or no rainfall after the 1st of June, and consequently there is no rush in harvesting. The grain is stacked unprotected in the fields until such times as it is convenient to thresh it. Light rains in the fall start the grass, and stock generally find plenty of good pasturage until Christmas, and many years go through the entire winter without being fed, but depending entirely on what can be found on the range.

SHERMAN COUNTY.

By J. W. Armsworthy, Wasco.

Sherman county is one of the richest agricultural counties in Oregon. It is situated in the northern part of the state, almost in the middle, east and west. The Columbia river forms the northern boundary, while on the west is the Deschutes. Here thousands of horse power constantly go to waste, only waiting for capital to harness the huge energy and turn it into commercial channels for the benefit of mankind. Here is an opportunity for manufacturing industries of all kinds. Flouring mills here would be adjacent to the great wheat fields of Sherman county, and easily accessible to market by either rail or water. Being near one of the greatest wool shipping markets in the world, namely The Dalles, and directly between that point and the great tracts of grazing lands where vast herds of sheep, producing fine grades of wool, are pastured, makes the manufacture of wool especially inviting.

The southern boundary is a deep, dry cañon. Here may be had building stone of the best quality. It is not assuming too much to claim that in the large cities of the Pacific Northwest, the near future will show imposing structures built from stone procured in the quarries of southern Sherman county. On the eastern side of the county is the John Day river, which, like the Deschutes, is a tumbling mountain stream, whose water power may be readily utilized.

These boundaries enclose a section of country 30 miles wide and about 40 miles long, every foot of which is available either for agriculture or grazing. It is now the largest compact wheat field in Oregon. The soil is a sandy loam, easily worked, highly productive, and adapted to all sorts and conditions of weather. Its lightness makes it nice to work, and thus farming is made easy. The farmers are in good circumstances. Very few farms have ever been lost through the mortgage system. It is a poor county for the money lender. Large sums of money come in to buy the produce, which are abundantly ample to do the business.

The plowing season is in the months of October, November, and frequently, December. In the spring farm work often begins in February, lasting until the crops have all been planted. The farms are usually large, often running into thousands of acres, consequently the work is done on a large scale. The average cost of putting the grain in the sack is not more than 20 cents a bushel. Thirty and forty thousand bushels of wheat is not an uncommon amount for a farmer to market. The average yield per acre for the past 5 years has exceeded 20 bushels. Rye, barley, oats, and corn are grown, and anything adapted to this climate that will grow is produced. Wheat is the principal product. The average amount for export is from 2,000,000 to 3,000,000 bushels, and even then all the available farm land is not cultivated.

Fruit culture is a thriving and growing industry. Thousands of dollars' worth of all the fruits grown in the temperate climate are raised yearly. While it may not equal in size the fruit of warmer climates, it is always nice-looking, and marketable anywhere. The flavor of all kinds of fruit will compare favorably with any that may be produced. Peaches do well, are sweet, juicy, finely flavored, and excel in the peculiar firmness of the fruit. Pears do well. Apples grow luxuriantly, and the soil and climate of Sherman county are peculiarly adapted to the growth of prunes. Both of these fruits are produced in excess of the home demand. Small fruits, strawberries, blackberries, currants, gooseberries, etc., grow well and produce abundantly. All kinds of garden vegetables grow well, and are produced sufficiently to satisfy the local demand. Potatoes are raised for export.

Sheep raising is an important and valuable industry in this county. Its large area of grazing land supports at this time about 40,000 head of sheep. The winters are frequently so mild that very little feeding is necessary, and often no feeding is done throughout the year. Owners of these flocks have been careful in the selection of their breeds, and the result is that the wool from this, or any other county in Eastern Oregon, is of the best quality, and is so recognized in the markets of the world. A good opening is here presented for the establishment of a scouring-mill, and some of the water power in the Deschutes or the John Day river could thus be put to a profitable use.

A large number of mutton sheep are shipped from this county to Eastern markets every year. Cattle and horses are raised in large numbers. Every year stock growers ship beef cattle east, which, in common with that class of stock throughout this part of the state, command ready sale at good prices Hogs are bred, fattened, and shipped in large numbers. The climate and grasses are favorable to the dairy interests, and although this industry is comparatively in its infancy, still many are engaged in it successfully.

Sherman being strictly an agricultural county, not much attention has been given to manufacturing The excellent quality of wheat grown here has attracted the attention of millers, and recently two flouring mills have been put in operation which manufacture enough flour to supply the home demand, and furnish a surplus to ship to outside markets. It is of a high grade and finds ready sale where offered. This branch of manufacture will grow. The wheat is at hand in any quantity; the power can be supplied by the running streams, and the ample transportation facilities for marketing by rail or water all conduce to the inevitable growth of flouring in this section.

The Oregon Railway and Navigation Company's railroad from Portland to the eastern boundary of the state, connecting with the Union Pacific to the East, passes across the northern end of Sherman county. In 1897 a few enterprising men, residents of this county, organized a company and built the Columbia Southern railway, connecting the interior of the county with the Oregon Railway and Navigation Company's railroad. It was built to Wasco, the largest town in the county, in October, and hauled out over 1,500,000 bushels of wheat that fall. Plans are maturing to build a branch railway from The Dalles, the head of navigation on the Columbia, to connect with the Columbia Southern near its intersection with the Oregon Railway and Navigation Company's railroad. This will give the people of this county the choice of rail or water transportation.

The following table shows the products marketed from this county in 1897:

Wheat, oats, barley, and rye, bushels	3,800,000
Butter and cheese, pounds	75,000
Potatoes, bushels	40,000
Prunes and plums, bushels	5,000
Apples, bushels	6,000
Wool, pounds	250,000
Corn, bushels	700
Hay, tons	10,000
Acres cultivated	180,000
Hogs, sheep, cattle, horses, and mules	49,000

While these figures are large, considering the area of the county, it is safe to say that in many instances they will be increased 50% within the next two years. Especially is this true of fruit. Many orchards now growing will then be bearing and double their output.

There are about 250,000 acres of deeded land, of which about 180,000 acres are in cultivation, and when all the available land is subjected to the plow many more thousands of acres will be added. Even then considerable land for grazing purposes will remain. The price of farm lands varies from $5 to $25 per acre, but most of the land of Sherman county may be had for $10 per acre. This condition of affairs will not exist when the government land is all gone. At the present time much valuable land—even much that is improved—does not come with reach of the assessor; consequently the tax rolls do not show the actual valuation of property in Sherman county. As it is, the valuation is more than $1,500,000.

The county is well provided with educational advantages. It has one academy, whose excellence and thoroughness have given it high rank. The public school system is in operation throughout the county. Many of the schools give instructions in the higher branches of study, and prepare students for college work.

The different religious denominations are well represented throughout the county, and are provided with comfortable places of worship.

The climate of Sherman county will commend itself to the favorable consideration of all who desire an equable temperature and a light rainfall. It is a common thing to hear that "it rains a great deal in Oregon," and while that is true in some parts of the state, in this county just enough falls to insure good yields from the soil in both cultivated and natural products. The average annual temperature is 52° Fahrenheit, and the average annual rainfall is less than 16 inches. The summers are ideal, with an average temperature of about 85°, cooled by the prevailing west winds that pass over the snow-capped mountains of the Cascades. The nights are always cool and pleasant. The autumn months are generally dry, like the summer months, but cooler. Winter usually does not last more than 5 or 6 weeks, and frequently is so open that one would scarcely recognize the presence of winter. During the coldest weather the temperature scarcely ever goes below zero. Indeed, it is a rare occurrence for it to go as low as that. The snowfall varies, but is never of great depth.

Since the history of farming in Sherman county began, winter wheat has never frozen out. The snowfall protects the fall-sown grain and gives the ground a moisture, which, supplemented by the rains, makes a failure of crops from drouth an impossibility. The general health of the people is good. Pulmonary and catarrhal diseases are unknown among the permanent residents of the county. Epidemics do not visit us, and the winter season, like spring, summer, and fall, is healthful. The best of roads prevail throughout the county, the sandy nature of the soil makes it impossible for them to become muddy or very dusty.

In these United States it is the farmer who rules every feature of existing government, political or otherwise. Then it is he who may choose for himself the best that nature may give. He should be entitled to the best home it is possible to obtain. No where on earth can he find a better place to live than in Sherman county. The advantages enumerated herein are all that could be desired to make a man prosperous and happy. It is only a question of a short time till every available foot of this fertile and desirable body of land will be cultivated.

WASCO—THE LEADING TOWN.

By virtue of its being the terminus of the Columbia Southern railroad, as well as by its locality, Wasco is, and always will be, the leading town of Sherman county. It is not the oldest town in the county, but it is the oldest in the interior. Wasco was first thought of as a town in 1883, and a better sight could not have been chosen. The general topography of the country is such that all roads easily and naturally lead to it. It was intended by nature as a business center. The growth of the the town has been steady and healthy, and it will always be the supply point of the vast wheat country tributary to it. Since 1892, hard times have left their mark everywhere, but Wasco has felt them really but little, when compared with many other places. During the past year she has grown rapidly, and more than doubled her population. At present there are 4 general merchandise stores, each carrying about a $25,000 stock. The average business for each is about $5,000 per month. It is now a good place for anyone desiring to engage in mercantile pursuits. Perhaps the largest class of business in Wasco, or for that matter, in the county, is forwarding, storage, and transportation. The Columbia Southern yards are more than a mile in length, tracks are thickly laid, and the whole length built up with warehouses. Over two thirds of all the wheat raised in Sherman county is handled by these houses, as well as that proportion of the freight brought in for the county and interior points. Wood, coal, and lumber yards are extensive, the county being a prairie country, these things must be brought in.

There are four large, well-equipped blacksmith shops, a large meat market, a metropolitan livery stable, barber shops, bath rooms, confectionery stores, cigar and tobacco stores. etc. One newspaper, laboring for the good of the city and county. The town is well supplied with a good clean class of amusements, and temperance prevails. *There is not one saloon in Wasco.* There are three churches and many religious societies. There is one flouring mill of 100-barrels' capacity, lately built, that makes the highest grade of flour. It has all it can possibly do to fill its orders. There is one substantial bank in town that does all the business of the county

There is an elegant public school building, well situated, commanding a view of the city, and under the management of the county school superintendent, an accomplished instructor. Four teachers are employed now, and soon more will be needed. Students are prepared for college work, and the school is on the accredited list of the state university.

The fraternal orders are well represented. The only company of the Oregon National Guard in the county is here. It is in a flourishing condition. Wasco is the only incorporated town in the county. The city government is composed of conservative business men. It has a good water system, and is negotiating for an electric light plant. It is connected with the outside world by both telephone and telegraph.

To the business man seeking a safe and desirable locality for business and a home, Wasco gives a tempting invitation. Good society, excellent educational advantages, a growing country of great possibilities are here. Business opportunities are presented. The people who live here are happy, contented, and temperate.

GILLIAM COUNTY.

By James S. Stewart.

There is probably not another county in the state more prosperous than Gilliam, with its population of slightly over 3,000, and its income of over $1,200,000—an average of $400 for every man, woman, and child within its borders—all coming from the soil.

This county is a mixed stock and farming county, but principally farming. Not many years ago stock raising overshadowed farming, and then it was thought that very little of the land was adapted to cultivation, but during the last few years a great change has taken place, and now the farmer is king, and the stockman is second in importance. From the assessor's roll it is seen that there were last year under cultivation 88,084·36 acres, as against 52,072 acres recorded on the roll of 1895; and from present indications the increase will be as great in the next two years. The *Oregonian* has already, from reports of correspondents, estimated the grain produced in Gilliam county this year at 1,500,000 bushels, but from careful inquiries the writer concludes that that estimate is about 250,000 bushels too high, and that 1,250,000 bushels is very close to the mark. This amount of grain, at present prices, is worth in the neighborhood of $850,000. About half of the grain crop has been put on the market, to provide for the necessities and pay the debts of the farmers; the remainder is being held for higher prices, of which there seems excellent promise. Enough has been said to show that Gilliam county is well adapted to farming; it only remains to be said that there are still many thousands of acres of government land open to the homesteader, free for the taking, and that there is hardly a mile in all the 80 miles of length, and 30 miles of width, of the county that does not contain patches of fertile, arable land. Our farming lands truly offer rich rewards to the industrious settler, and that is the only kind of settler we want and need.

Notwithstanding the great increase in farming, stock raising has held its own, and one class, viz., sheep, has notably increased. The census of 1895 shows 8,801 horses; and the assessor's roll this year gives 8,601, and the 8,601 head of horses are more valuable at the present time then were the 8,801 in 1895. Of cattle, the assessor this year enumerated 8,518, as against 8,854 in 1895. As with the horses, so this year's slightly smaller number of cattle is much greater in value than was the larger number of 1895. This is partly due to the higher ruling prices, and partly to the fact that owners are ever improving the *blood of their herds.*

The estimated number of sheep in Gilliam county at this time is 150,000, and a conservative estimate of this year's wool clip places it at 1,500,000 pounds; value, $150,000. Of this amount, 1,158,840 pounds was shipped from Arlington, most of the remainder being shipped from The Dalles, and a portion of it from Heppner. The 1895 census gives the number of sheep as 96,422, and the pounds of wool 633,256; so it is readily seen by comparison that there has been a wonderful improvement during the past two years in the quality as well as the quantity of our sheep. Thoroughbred bucks, and better attention to flocks, are responsible for the increase in the number of pounds of wool per sheep. Competent, impartial judges say that sheep raised in Gilliam county, Oregon, are now the best on the Pacific coast for wool and mutton qualities combined. About 30,000 head of mutton sheep, value $75,000, were sold by Gilliam county sheepmen this year.

Two hundred and eight cars of cattle, about 4,500 head, value $80,000, were shipped from Arlington alone during the year ending December 1, 1897, and at least half that number of Gilliam county cattle was shipped from Heppner and The Dalles, which stations are more accessible than Arlington to some of the cattle ranges. This makes a total revenue of $120,000 from cattle alone. This is exclusive of the number required for home consumption, necessarily large, as we have no vegetarians, and every one eats meat.

Several thousand dollars' worth of horses have been exported during the year—the first for several years—and as the market for horses is steadily improving, the horsemen are becoming imbued with the courage of hope and are paying more attention to their stock than they have done for years. The past few years have not been ones of prosperity for horse raisers, but at last the silver lining in their cloud is breaking through. Abundance of hay has been put up to feed the horses, as well as the cattle, through a Gilliam county winter, which lasts all the way from two weeks to two months. At the present writing, December 15, 1897, grass is growing nicely, and the bulk of the county's stock has not yet been fed a bite of hay.

During the last year our farmers raised enough hogs to supply the home market, besides some 20 carloads, worth about $8,000, shipped to less favored communities. Almost every staple article of diet can be produced on a Gilliam county farm, and the intelligent farmer has to spend very little money to provide abundant and wholesome food for his family. Potatoes and other vegetables grow here to perfection, and a little work is all that is needed to insure a bountiful crop. The farmer's thrifty wife makes butter and to spare, and the cattle, sheep, hogs, and poultry furnish a healthy variety of meats. Already on many farms there are orchards producing all the fruit required for the family's needs; on other farms young orchards are fast approaching the bearing stage, and there is scarcely a farm on which some fruit trees have not been set out this fall. One nursery alone delivered $500 worth of fruit trees in Fossil last month, and a like amount in Condon, and lesser quantities at every village and postoffice in the county. When these bear fruit Gilliam will not only supply the entire home demand, but part of the foreign demand as well. There are two or three townships of timber in the southeastern portion of the county, which furnish fuel and lumber for all that portion of the county, except the portion immediately tributary to Arlington, which is on the railroad, and 60 miles distant from the timber belt.

Besides a number of villages, all supplied with churches and public schools, Gilliam county has three prosperous and incorporated towns, each having from 300 to 400 inhabitants: Arlington, in the north; Condon, 40 miles south of Arlington, in the center, and Fossil, 20 miles south of Condon, and about 20 miles from the county's southern line. Arlington and Fossil each have several handsome and commodious two-story brick buildings.

The following summary proves the per capita statement made at the beginning of this article:—

Grain	$ 850,000
Wool	150,000
Cattle	120,000
Mutton sheep	75,000

Hogs	8,000
Miscellaneous products	3,400
Total	$1,206,400

This total, divided by 3,016, the population of Gilliam county, gives a per capita of $400, exclusive of a large proportion of the county's food supply. With such a showing as that the people of Gilliam county would be a set of ingrates if they were not, as they surely are in the main, contented and happy.

Gilliam county has too few manufactories to justify a separate article describing them. It is hoped this will not always be the case. The Butte Creek Land, Livestock, and Lumber Company's sawmill, 7 miles southeast of Fossil, this year put out about 1,000,000 feet of lumber and 500,000 yellow pine shingles. It employs, when running, about 20 hands. The Lost Valley sawmill, owned by Halstead Brothers, has an output of about 500,000 feet, and employs in the neighborhood of a dozen men. The fossil flour mill has a capacity of 50 barrels per day, and employs 3 men. The Mayville flour mill, with an output of 40 barrels, employs the same number of hands. There is also a small flour mill at Olex. These mills supply the county's demand for flour, and the Fossil mill also supplies large portions of Grant, Crook, and Wasco counties with flour. This mill is lighted by electricity. All the mills mentioned, except the Olex one, which has water power, are operated by steam.

MORROW COUNTY.

Vawter Crawford and Otis Patterson in Oregonian, January 1, 1898.

Situated almost in the center of the northern portion of the state, and in what is considered one of the most valuable sections of the Northwest for stock raising and agricultural pursuits, is Morrow county. The county is bounded on the north by the Columbia, on the east by Umatilla county, the south by Grant, and the west by Gilliam. For the most part its lands are what would be considered rough by the average Easterner, but to the people of the West they compare favorably with most other localities. The contour of the country is marked by many high hills, abrupt, as a rule, on the northern and eastern slopes, but more gradual on the west and south. Much of the land in the county is high tableland, and is very productive in wheat and other cereals. The southeastern portion of the county is cut up very much by the Blue mountains, making it very profitable as a summer range for the flocks and herds. This part of the county also contains its timbered and mineral wealth—points the writers desires to mention later.

Morrow county was created out of a portion of Umatilla by act of the state legislature of 1885. It is named for "Uncle" Jack Morrow, one of the early settlers, and a man who was very active and energetic in the promotion of the scheme of forming the new county. Mr. Morrow still lives in Heppner, the county seat, and is a most respected and highly honored citizen. While this is a new country, comparatively speaking, great advancement has been made in developing her resources, and Morrow stands today, along the line of progress, well up among those counties of the state that have had better advantages in the way of early settlement and development. But there is yet vast room for improvement. Large resources are still lying dormant and awaiting the touch of the honest toiler to bring them forth into life as a wealth-producer.

The intent of this article is not to go into an extended discourse of the county, but rather to show, by facts and figures, what was done last year, and thus to prove that it is a locality that is rich and productive, and gives good returns to the producers. Last year was one of general prosperity to Oregon, and Morrow county has come in for her share.

The chief industry is sheep raising, and much of the land is at present used as ranges for the numerous flocks that roam over a "thousand hills." Some figures along this line are good reading. There are in the county at present, 300,000 head of sheep, valued at $750,000. From these sheep there were taken 3,000,000 pounds of wool, which sold at an average price of 9 cents per pound, bringing into the hands of the wool growers $270,000.

Besides this, early in the spring some 75,000 head of sheep were disposed of, to be taken to the Eastern markets. These figures show that the sheep business of Morrow county is very large, and it is made to reach such proportions from the fact that the county contains so many thousand acres of good bunch grass land. Many thousand head of horses and cattle also range in the county, and are another source of wealth. There were shipped from the county last year 3,600 head of cattle, which brought an average price of $18 per head, making a total of $64,800.

The wheat production of the county last year was large, considering the acreage harvested. Some portions of the county suffered loss from the grasshopper pest, and especially was this the case in the northwestern portion, and this greatly reduced what would have been the largest yield in the country's history. However, it is estimated that there are 300,000 to 400,000 bushels of wheat for export, and plenty left for home consumption. Much of the crop has been sold and shipped and brought good prices, the average being perhaps about 65 cents. This would show a return to the farming element of the county of over $200,000.

These figures are given to show something of what has been returned to the residents of this portion of our state the past year. Of course prices for all these commodities have been better than for many seasons past, and this has been a great help, but it must also be taken into consideration that the productiveness of the soil and other natural resources of this county have had much to do with it. What has been done this year can and will be done another year. People are reaching out, enlarging their businesses, increasing their flocks and herds, putting in a larger acreage of grain, and all industries are moving forward in a way that promises great things for the future, and another year will bring forth greater returns than the past has recorded. Morrow county is surely destined to stand in the front rank of Oregon's agricultural and stock raising counties, and that in the not far distant future.

During last summer the development of numerous gold-bearing ledges has been undertaken by a Heppner company. There is an immense body of free-milling ore in these mountains, and though of low grade, it can be worked cheaply and will give great returns for money invested. One ledge assays at the grass roots $27.60 per ton, and it is, free milling. The prospects run all the way from $3 to the amount mentioned, $27.60 and by early spring it is expected that a quartz mill will have been established on one of these valuable lodes. Many prospectors are waiting till the snow goes away that they may pack up their outfits and go to the mountains back of Heppner.

No better body of timber exists in the Blue mountains than that in Morrow county. However, it is inaccessable except for local trade, but a flume to Heppner from the head of Willow creek is being constructed as a feasible and paying plan to get lumber, railroad ties, wood, and fence posts to the railroad. This done, the timber belt becomes a source of great revenue. At present three mills supply the local demand for lumber.

Morrow county wants people with money to assist in developing her great resources, and these will meet with substantial encouragement. One of the greatest drawbacks to this section has been that too many have endeavored to float great schemes with nothing, and failing, they have plunged others into debt. Morrow county is full of opportunities, and a man with a reasonable amount of means is the person to take hold of them.

UMATILLA COUNTY.

By Pendleton Commercial Association, William L. Shwerick, Secretary.

Umatilla county lies in the northeastern part of the state of Oregon, its entire area being included within the great range of the Blue mountains. It is bounded on the north by the state of Washington, on the east by the Blue mountain range, on the south by Grant county, and on the west by Morrow county. The topography of the county, with the exception of the eastern and southern parts (which are a succession of lofty hills and deep cañons, many of the former rising to dizzy heights, and hundreds of the latter sinking into bewildering depths, with precipitous walls of rock and earth), is undulating and particularly well adapted to the growth of cereals, the production of wheat equaling annually 1% of the wheat grown within the confines of Uncle Sam's domain, or 5,000,000 bushels of wheat for the year 1897.

Most of the hills are covered with magnificent conifers—spruce, balsam, fir, and cedar, while the valleys, or cañons, furnish a rich growth of oak, and poplar, and all the varieties of trees found in the foothills of Oregon. There are also some excellent quartz and placer mines in the southwestern part of the county.

Every part of the county enjoys a climate unrivaled for healthfulness and pleasure. Malarial disorders and fevers are totally unknown here.

The water obtained from the numerous mountain streams is of the purest possible quality, being fed by the vast mass of snow melting from the summits of the Blue mountains. The crystal torrents on every side, tearing and foaming over the rocks, pursuing their serpentine ways through the wild, yet beautiful cañons, peculiar to the Blue mountain range, rushing with mighty swiftness along their narrow channels, and singing their ever sweet song of rushing waters, are laden with countless numbers of beautiful mountain trout, choice prizes for the eager angler; all of which attractions during the summer months draw many seekers of health and pleasure to these banquet halls of nature.

The county is traversed by the Umatilla river, which flows directly through the center in a northeasterly direction, and empties into the Columbia at Umatilla rapids, the Wild Horse in the central part, the Walla Walla river in the north, Willow, McKay, and Tutuilla creeks in the south, together with numerous affluents pertaining to them all. All of these, with the exception of the Walla Walla river, flow into the Umatilla river.

The proportion of mineral to agricultural and grazing lands is exceedingly small; farming and stock raising from the first, being the principal occupation. Yet enough is known of the mineral wealth of the southwestern part of the county to cause old miners to believe that many of the hills and mountains are vast treasure vaults of nature, needing only the brain and hand of man to unlock the carefully hidden combination.

The number of acres of land at present under cultivation is 316,666; non-tillable, 404,558. It is roughly estimated that we have of cattle, about 150,000 head; of sheep and goats, 225,000. The assessment returns for 1897 show 4,274 swine.

There are 106 school districts in the county; 140 teachers, four fifths of whom are females. The average pay of teachers is $43.50 per month. There are 5,569 children of school age.

THE CITY OF PENDLETON.

The best evidence of the resources and prosperity of Umatilla county, is the solid, substantial and prosperous condition of the city of Pendleton, its county seat, supported, as it is, mainly by the trade of the people of this county. It is no boast to assert that for the size of the place, few cities can equal it in the amount of business transacted, and the extent of its trade. These speak for themselves, and leave no doubt in the mind of the critical observer that this city has a fine basis.

Pendleton has been styled the "Metropolis of Eastern Oregon," and well does it deserve the title, for situated near the center of the best and most flourishing county of Eastern Oregon, and its county seat, with three lines of railroad centering here, and the monied and banking center of a very large extent of country, together with its natural position and advantages, as well as its present substantial growth, it must necessarily be the most important point in this section, and these advantages make it the objective point of all those who visit the country east of the Cascades. Besides being the center of trade and of the large and varied interests of Umatilla county, it is centrally located, being about 53 miles from the boundary line of Grant county, on the south; 36 miles from the Columbia river, at Umatilla, and 35 miles from the northeast corner of the county. It is also an important railroad center, and the chief city in size and population of Eastern Oregon; and those who are conversant with the extent of the resources of the country that surrounds it, predict for it a destiny that will make it second, in commercial importance, to no city in the interior Northwest.

The town of Pendleton was laid out, in a fashion, in 1869, and christened with the name it bears in honor of Hon. George H. Pendleton, the distinguished statesman of Ohio. At that time the country for hundreds of miles in all directions was very sparsely settled, and, therefore, Pendleton was simply a trading point and made no pretentions to claiming any prestige as a town. Its growth was necessarily slow, but as the country began to fill up with settlers the population of the town increased until, in 1882, it had about 700 inhabitants; in 1885, something over 2,000; in 1891, about 4,000, and now about 5,000. In 1888 the gross assessed valuation of property within its limits was $800,000, and the gross assessed valuation in 1889 was $1,434,285.89, while in 1891 it was $1,650,000; thus showing the rapid increase of values in the past few years.

Besides the rich farming lands which are tributary to Pendleton, it is the trading center for the large stock and wool interests of this section, 60,000,000 pounds of wool being scoured, baled, and handled here annually.

The growth of the city has kept pace with the development of the county until in 1884 it became necessary to encroach upon the Indian reservation lands that bounded it on all sides, except the northwest, and by special act of congress, 640 acres of this reservation land, contiguous, was laid off into blocks and lots and sold to the highest bidders, which afforded the necessary scope for the town to expand. These lots and blocks have been largely occupied, and the town, now a city, is still expanding. The Umatilla river runs through the city and is spanned by three substantial bridges for the passage of wagons and other vehicles (besides the bridges used exclusively for railroad purposes), one about a mile above town, one at the foot of Lee street, and one at the foot of Main street.

A first-class graded public school is conducted in a large and commodious brick building, and nearly 1,000 pupils are in daily attendance there. There are also the Pendleton academy and the Catholic boarding-school—St. Joseph's academy—both of which own their own grounds and buildings, and are in a flourishing condition. One or two private schools are also usually conducted in Pendleton. These schools are under able instructors, and so popular have they become, that they have a large patronage from a distance.

Pendleton has seven churches, the Northern Methodist, Southern Methodist, Episcopal, Catholic, Presbyterian, Congregational, and Baptist. The houses of worship are all comfortable and creditable edifices, and their pastors are able and zealous. Their Sunday schools are well conducted and attended, and there are some charitable and religious societies fostered and maintained by these churches, or through their influence and exertion.

In the city are two Masonic blue lodges and one chapter, which have about the finest temple in the state—a fine brick structure; also two lodges of Odd Fellows, two of the Knights of Pythias, one of the A. O. U. W., and the usual number of mutual benefit societies of every description.

There are six newspapers published in Umatilla county, viz.: The *East Oregonian*, daily, weekly, and semi-weekly; the *Tribune*, daily and weekly; the *Pendleton Republican*, weekly; the *Alliance Herald*, *Milton Eagle*, and the *Athena Press*, the four first named being printed at Pendleton.

The two local banks in Pendleton, the First National and the Pendleton Savings Bank, carry more than a million dollars of deposits, thus affording an abundance of local money for all purposes.

UNION COUNTY.

By Hon. D. A. McAllister and B. F. Wilson, of La Grande.

Union county is the most northeastern county of Oregon but one. It embraces about 2,000,000 acres in extent, about 1,600,000 being surveyed.

The prominent and characteristic features of Union county are its mountain ranges, fertile valleys, numerous streams of never failing flow, its rolling hills and beautiful and varied scenery.

These mountain ranges vary in elevation from a few thousand feet to 10,000 feet above sea level. The highest peaks are continually covered with snow, from whence is fed the hundreds of streams and water courses. The lower range of mountains are covered with timber, consisting of pine, tamarack, and fir in great quantity. The largest of the valleys is the Grande Ronde, it being 30 by 18 miles in extent, through which flows the Grande Ronde river with its 4000 inches of water in low stages. Other valleys are Powder river, Eagle, Pine, Big creek, Antelope, and Indian creek, all of which are rich in soil and varied in products.

Climatic conditions are very favorable to the health of the inhabitants and to the productions of the soil. Spring opens usually from the 1st to the 15th of March, when the sowing and planting of crops begin. Showers of rain are expected during April and May, although not sufficiently to interrupt the farmer's work. More or less rain falls during the months of June and July, but August is usually dry. The rainy season begins again usually about the 25th of September to the 1st of October, and rain may be expected to fall more or less for at least a month, and some seasons continues until November. The warmest weather occurs during August, when occasionally for a few days 100° Fahrenheit is reached. However the heat is never oppressive, owning to the cool breezes that come from the high mountains. A great deal of snow falls usually during the winter months, especially in the mountain districts, it attaining great depth in the high mountain sections. In the valleys, especially in the Grande Ronde, it seldom falls to a greater depth than 8 to 10 inches, and seldom remains longer than a week or ten days at a time. The extremes of the winter cold are moderated by warm winds which come from the southwest, and are locally known as "the Chinook." The average temperature for the winter months is about 30° Fahrenheit, the thermometer usually registering about zero for a few days about Christmas time.

The soils in the Grande Ronde valley are principally black and sand loam, and are deep, rich, and strong. The same may be said of the soils in other valleys, though different conditions as to formation and wash produce different conditions in the soils. The products are cereals of all kinds, hay, fruits, and garden vegetables, which are produced in abundance. Irrigation is not required, except in a few places, the ground being sub-irrigated by means of the numerous streams. Sixty bushels of wheat, 75 bushels of barley and oats are frequently produced to the acre. Of the large fruits, apples, prunes, plums, pears, and peaches, grow to perfection. Of the small ones, strawberries, blackberries, gooseberries, raspberries, currants, etc., are produced in great quantities. Garden vegetables of all kinds are grown in great abundance and of the best quality. The wash from the mountains during the time of the melting of the snow in springtime, has made the soils of the valleys, and each year adds anew to its vigor and quality. The deep snow of winter that falls in the high mountains, is a never-ending source of water supply that sub-moistens these soils, and renders them as perfect for the purposes of agriculture as it is possible to find in land anywhere.

Agriculture in all its varied forms is followed as a business in this country. Wheat, oats, barley, hay, garden vegetables, and fruits are grown in abundance and to perfection. Farming in all its forms is carried on on a large scale. The largest wheat farm contains 7,000 acres, the largest orchard 160 acres, and gardening areas run from 1 to 40 acres. In the Grande Ronde valley, some 2,000,000 bushels of wheat was harvested during the past year, much of which has been shipped out either in bulk or in the form of flour. Thousands of tons of hay are harvested each year, which finds a ready market at from $8 to $10 per ton on board the cars. During the past year about 75 carloads of apples were shipped from this valley to Eastern points, besides numerous carloads of strawberries, raspberries, cherries, and other fruits. The yield in all these various productions is highly satisfactory to those engaged in the raising thereof. And it cannot be otherwise when all conditions are exceptionally favorable to the same.

Union county is naturally adapted to sheep husbandry, owing to its immense area of mountainous and hilly country, all of which is susceptible of sheep pasturage in summer, the valleys furnishing abundance of hay for the wintering of them. However, during the past five or six years this industry has not received the attention that it did in years previous when the profits were greater. Every condition is favorable here for the industry, the climate, the range for the summer months, and plenty of hay for the winter. There are about 50,000 head of sheep kept in Union county the year round. At present prices for sheep and wool, there is great profit in sheep raising in this county.

More attention is given to the raising of cattle in Union county than to any other kind of stock. They are raised in great numbers in every portion of the county and are very profitable. Hundreds of carloads of cattle are sent out of Union county each year. Hogs and horses are of almost spontaneous growth in this county; they are raised in every section of the county, and to perfection. Cattle, horses, and hogs are a source of great wealth to Union county, and always will be. The country is naturally adapted to their profitable raising in almost every way. Stockmen, as a rule, have taken pains in the breeding of their stock, and thoroughbreds and standard-breds are to be found everywhere. The Hon. D. A. McAlister, of La Grande, has for years been extensively engaged in the breeding of roadsters and trotters, the gets from his well-known stallion, Lemont, having in many instances been record-makers in the Northwest.

Quite a number of farmers in the Grande Ronde valley and in other valleys have given considerable attention to the breeding of large draft horses, such as the Norman, Clydesdale, and English draft. Mr. W. T. Wright, of Union, Oregon, is engaged in the breeding of thoroughbred Jerseys; the Peach Brothers, of Island City, of Jerseys and Shorthorns, as well as others in other sections of the county, who have given considerable attention to the improvement of the breeds.

A number of persons in various sections of the country have engaged quite extensively in the dairying business, although this business is in its infancy. There is hardly any limit to the possibilities of this business. Every condition is favorable, and abundance of pasture lands, hay, and grain, excellent opportunities for the growing of all kinds of roots suitable for feeding purposes, and climatic conditions, are all unequaled in the Northwest, and possibly anywhere. The packing of butter and the making of cheese as an industry in Union county is destined to be a source of great revenue to the county. Every facility and every advantage is here offered for the same.

The forests of pine, fir, spruce, and tamarack of Union county, consisting of timber suitable for lumber and railroad ties, are practically inexhaustible. A great deal of this timber is easily accessible, or can be made so at a reasonable expense. The numerous large streams of water afford water power facilities for either manufacturing or transporting of the highest character. While lumbering is receiving considerable attention at a few points, it is as yet in a backward state, owing to the lack of capital to take hold of the industry. The timber is here in great quantity and of an excellent quality, and with the advent of capital necessary to develop it, this industry is sure to be one of great importance in the county.

At present there are in the Grande Ronde valley six flour mills of a combined capacity of about 800 barrels of flour per day. Not over one third of the wheat product of the valley that is subject to export is manufactured into flour. The flour that is manufactured is of first grade, the quality of the wheat being of that character to insure an excellent grade of flour. Excellent facilities are offered in several localities for the manufacture of flour. Water power can be had in abundance and with railroad facilities at hand. Excellent facilities are offered at several points in the Grande Ronde valley for flouring mills and especially at La Grande. It is the principal shipping point in the county for all kinds of produce and livestock. It at present has a flouring mill of only 125 barrel capacity, which is run by steam power. There ought to be a mill here of at least 500 barrels capacity, and there are ample facilities for it. Water power is at hand, and ample railroad facilities, and the wheat belt of the valley is adjacent to it. The markets for flour which are being opened up in the Orient, are ample to take care of all the flour that can be manufactured in the Northwest. Besides, the mining industry just now is receiving a great impetus both as regards the Northwest and Alaska, and the manufacture of flour here ought to receive the attention of capitalists who are seeking safe and compensatory investment.

During the present year of 1898, there will be established at La Grande a beet sugar factory and refinery of the capacity of 350 tons of beets per day. A subsidy of $80,000 was raised to induce capital to take hold of the enterprise, and success has met the efforts of the people. Capital has taken hold of the matter, Mr. David Eccles, of Utah, and associates having become interested, and the factory has already been constructed. The Sugar Factory Company have entered into contract with the farmers of the Grande Ronde valley in the vicinity of La Grande for the growing of 3500 acres of sugar beets for the period of 5 years, the beets to be purchased at not less than $4 per ton, and with a sliding scale of prices by which the farmer will receive 25 cents per ton in additional for every 1% of sugar in the beet above 14%. Three carloads of beet seed were furnished for this year's crop. The factory will be in operation by the 1st day of October, or soon thereafter. The advantages for the growing of the sugar beet, and the manufacture of the same into sugar, offered in the Grande Ronde valley are not excelled anywhere in the United States. Experiments in the growing of the beet in this valley for the past seven years have proved beyond doubt the truth of this assertion, and the fact that a company is investing in a plant to cost upwards of $500,000 (with the view of increasing their capacity after the first year to a 700 ton per day proposition) is also ample justification of the claim made. This factory will be the first of its kind in the Northwest, and it certainly means a great step in advancement of the interests of this entire section.

Union county is one of the richest sections of the Northwest in mineral deposits. Mining has been carried on here for the past 30 odd years. In early days placer mining only was carried on, but during the past 15 years quartz mining has grown to large proportions. The Cornucopia, Sparta, Sanger, East Eagle, and Basin districts, as well as the Grande Ronde districts, have established reputations as great wealth producers. Over $1,000,000 in gold have been taken out of these districts during the past year, and the year 1898 will see this amount doubled, and possibly trebled. There are hundreds of quartz locations in these districts, not one of which, when developed, has been disappointing. Every developed claim has shown good results. There are 9 quartz mills, with from 5 to 20 stamps each, that have been in operation in these districts during the past year, each of which has given satisfactory results to the owners. That Union county has vast mineral wealth, is a question that has been fully demonstrated and settled, and hundreds of properties are only waiting for capital to open them up and make profitable producers of them.

Magnificent streams of water, affording unexcelled facilities for manufacturing purposes, are found in various portions of the county. In the famous Grand Ronde valley, the Grand Ronde river flows about 3,500 inches of water at its low stages, and Catherine creek flows 2,500 inches at low stages. There are many places in the valley where the water of these streams can be utilized for manufacturing purposes. Other streams are found in other portions of the county, which can be utilized for power, but only those are mentioned here which are near railroad facilities.

The main line of the Oregon Railway and Navigation Company's railroad runs through the Grand Ronde valley (entering the county at North Powder and leaving it at Kalema), a distance of 52 miles. The Elgin branch extends for a distance of 25 miles north from La Grande, traversing the great wheat belt of the valley. It is proposed to build another branch from La Grande to the Cove in an easterly direction, which will practically put every portion of the Grand Ronde valley within easy reach of a railroad.

La Grande is the largest city of the county, containing about 4,000 inhabitants. It has railroad shops, round house, and other railroad accessories. La Grande is and has been a very important shipping point, being the main point in the Grand Ronde valley, and the outlet for the products of all kinds from Wallowa county. It is expected that the building of the sugar factory and refinery will double its population inside of two years. Union is the county seat at present, and has a population of about 1,200. It is situated on Catherine creek, a fine stream of pure mountain water, with facilities for manufacturing unexcelled. A woolen mill graces the banks of Catherine creek, and the town lives in hopes that capital will be attracted to build other manufacturing establishments. There are numerous small towns in the county, but without railroad facilities, excepting Elgin, the terminus of the Elgin branch.

An excellent school system is established in Union county, which is supported by the state school fund, and by local taxation.

A high school is established at La Grande and one at Union, each of which is in a flourishing condition. The school term in each of these schools is from 7 to 9 months each year. In the various other school districts of the county, the school term varies from 6 to 9 months each year. Many of the religious denominations are represented by suitable church edifices and by church organization.

Union county must not be overlooked by the homeseeker, as most excellent opportunities are offered here. It only needs to be seen, and its merits investigated, to be appreciated.

WALLOWA COUNTY.

From Wallowa Chieftain.

Wallowa, the northeastern county of Oregon, though in some degree isolated from other portions of the state on account of being surrounded by mountains, and having no railroad communications within its borders, has the elements of wealth that, when the developments which are rapidly being pushed forward, are completed, will make it one of the richest in the state. The soil is of a character to produce, and does produce all the grains of a temperate climate, to the highest degree of perfection. The greatly varying altitude, from the perpetual snow line of the mountain summits, to within only a few hundred feet above the sea level, on Snake river, makes it practicable to produce every variety of fruit, from a crab apple to the finest quality of grapes, peaches, apricots, etc., and in the vegetable line, from a rutabaga to a sweet potato. This statement is fully verified by the fact that 51 first premiums were awarded on grain, flour, fruits, and vegetables at the First Eastern Oregon District Fair, held at La Grande last fall.

An idea may be gained of the grain produced, by the partial report of some of the various threshing machines, but owing to the distance from market, raising grain to sell, is not one of the leading industries of the county; but yields place to the more profitable business of stock raising, which, owing to the many thousand acres of unclaimed range, much of which is in localities where snow seldom falls, is carried on with most satisfactory profit. The wealth that is every year gathered from the rich bunch grass ranges is thought by many to fully compensate for the inconveniences of not having railroad communications with the centers of civilization, while others of more commercial views think the vast forests of timber, and exhaustless beds of building stone, and ledges of marble known to equal any in the world, and the increase in population that a railroad will bring in and support, would more than compensate what the stock industry would lose. But these questions will no doubt satisfactorily settle themselves when the proper time comes.

As a matter of course, most of the best land is claimed and proved upon. There are yet vacant thousands of acres unclaimed, on which comfortable homes will be made, Newcomers are availing themselves of the opportunty of getting a portion of the public domain that is so rapidly disappearing from the plats of the land offices of the United States.

The mineral resources of the county have not been developed to any great extent. Knight & Camp, Legore Brothers & Ross, and perhaps others, keep up their assessments and yearly do the development work on their quartz claims, as they are satisfied that with proper machinery on the ground, or cheaper transportation, the ore could be profitably worked. Forester and Shoemaker, of Cach creek bar, on Snake river, and other parties yearly take advantage of the melting snow in the spring to get considerable gold from the sands of the rich bars on Snake river in this county.

The educational and religious interests of the people are perhaps as carefully looked after as in any other portion of the state. Resident ministers of the leading denominations are established here. Interests are common enough to prove that people live as well here as in other places. Aside from the required public schools, Joseph, Enterprise, and Lostine have each an academy, in which the young people are instructed in the higher branches of learning. Wallowa has no academy, but has a fine school building, and a school of two departments, of which they are justly proud.

The county is served with a daily mail service from Elgin to Joseph, supplying the towns of Wallowa, Lostine, and Enterprise, while the northern part of the county, in which are situated the rich and flourishing settlements of Flora, Paradise, Arko, and Lost Prairie has a semi-weekly service. This country, so lately a wilderness, is, by its excellent class of citizens, becoming an important part of Wallowa county. Flora has two stores, a sawmill, planing mill, and other shops. Paradise has one store of general merchandise, a blacksmith shop, and a wagon shop. Orchards are being planted, and other permanent improvements made all over the county.

Imnaha and Snake river in the eastern part of the county are the principal fruit raising and winter range sections of the country. There are, however, many fine orchards in Wallowa valley proper, where apples, pears, plums, and prunes are successfully grown, but it is to the Imnaha and Snake river that people go for peaches, grapes, apricots, and such fruits as only grow in warm climates. It is here on the bunch grass covered hills, usually bare of snow, thousands of horses, cattle, and sheep graze without prepared feed and almost without care during all the months of the year.

Wallowa county is undoubtedly one of the best stock raising counties on the Pacific coast. With its broad expanse of rolling hills, which furnishes an abundance of grass during nearly all the months of the year, and the almost unlimited summer range in the mountains which surround the valley, it may well be called "the stock raisers' paradise."

For beauty and grandeur the natural scenery of this county is unsurpassed by any in the world. This is the verdict of all tourists who have ever visited Wallowa Lake and other remarkable places in this county. No person ever visited this county for pleasure or recreation, but who was fully satisfied with his visit.

Below is given, in tables, a partial summary of the production of the county during the past year, but owing to the difficulty of getting statistics only a very faint conception of what the county really produces can be gained.

THE GRAIN PRODUCT.

As near as we are able to estimate, from the statistics gathered from various parts of the county, the amount of grain raised in this county this year, was as follows:—

Wheat, bushels	240,000
Barley, bushels	80,000
Oats, bushels	48,000
Rye, bushels	16,000

Nearly all of the wheat is hauled to the flouring mills, of which there are now three in number, located respectively at Joseph, Enterprise, and Wallowa. The mill at Lostine was burned recently.

FLOUR SOLD TO OUTSIDE POINTS.

All of the mills ship more or less flour to outside points, such as Baker City, Elgin, La Grande, and some has been shipped as far as Portland, San Francisco, and even China and Japan. The amount shipped by each mill was as follows:—

Wallowa, carloads	20
Joseph, barrels	6,000
Lostine, barrels	4,000
Enterprise, carloads	12

STOCK INDUSTRY.

This is the most prominent and most lucrative business in the county. Some idea of the amount of wealth brought into the county by this one industry can be obtained from the following table:—

Cattle shipped from the county via Elgin, Uniontown, and Athena	3,680
Sheep, head	16,000
Hogs, head	3,000
Horses, carloads	5

From the above table, by a little computation, one may form some idea of the amount of money derived from livestock alone. Valuing the cattle at an average of $24 per head, 3,680 head would amount to $88,320, or in round numbers $50,000, for there were quite a number driven to Walla Walla of which we have made no account. The 16,000 head of sheep at an average of $2 per head, will amount to $32,000. The 3,000 head of hogs with an average weight of 275 pounds, at 3 cents per pound, amounts to $21,750. The horse market has, within the last few months, increased very perceptibly. The five carloads shipped from Elgin, and quite a number driven out to other points, will possibly aggregate several hundred head at probably an average price of $40. The enormous sum of $105,750 has been brought into the county by livestock alone.

The grand total is raised still higher when we receive the warehouse statistics, stating that 643,800 pounds of wool were received from this county this year. At an average price of 9½ cents per pound, the amount received for wool alone was $61,161. Adding this to $105,750, we have $166,911, which has been brought into the county by livestock and wool. All of the above estimates are considered very conservative, and probably much under the actual number of each class shipped out of the county.

Quite a number of our citizens make a business of buying up butter, eggs, and bacon, and hauling them to La Grande, Elgin, and the mines in Baker county. It would be impossible to arrive at an estimate of the amount derived from this business, but it is of no small amount. All of these different amounts may seem small to our larger and more densely populated sister counties, but they must remember that the largest vote ever cast in Wallowa county was something over 1,100, and the population in 1895 was only 3,981.

Estimating the population at 4,000 in round numbers, we find that within the last year enough actual cash has been brought into the county to give every man, woman, and child $41.73. By making an estimate of the other wealth remaining in the county, the per capita wealth would be raised much higher, possibly five or six times higher.

The past year has been one of a grand revival in business for Wallowa county. The price of cattle and sheep has risen to such a point that stockmen have realized a good profit for their labor, and are consequently prosperous and happy, and glad that hard times are no more.

The merchants have also profited by the prosperity of the county, and report trade 40 better than the same months last year. It was gratifying to note the increased holida trade enjoyed by all the business houses in the county.

It is to be expected that a section having the latitude of Ottawa, Canada, and c Northern Maine would have a climate as rigorous as is found in those sections, an especially so with the elevation that the county has, but such impression is in erro Since November, 1889, daily temperature and precipitation observations have been mad at Joseph, by Mr. W. A. Leslie, now deceased, and by Mr. J. D. McCully, the latter cor tinuing them. From these observations it is found that the annual temperature is 42 July and August have means of 63°, and January, the coldest month, has a mean of 32 The mean temperature is below the freezing point from December to April, when t warmth of summer rapidly approaches.

The temperature much resembles that of Colorado, or in Minnesota, with an absen of the latter's low and continuous cold of winter. The temperature is modified by t proximity of the Pacific ocean, and by the Rocky mountains to the east. The latter wa off the cold air that flows on the eastern slope of the Rocky mountains from the Arctic regions to Montana and the Eastern states. The ocean modifies the temperature, as all great bodies of water do. There is a third reason for the comparative high winter temperature, and the most important, and that is the occurrences of the chinook winds. These winds are from the south, and mechanically produced by the action of the air.

The annual precipitation is 19·27 inches; precipitation includes rain, melted snow, sleet and hail. The distribution of precipitation throughout the year is better than any other county in Oregon, this fact being, no doubt, due to the trend of the mountains and their position with reference to prevailing winds. January has the greatest monthly amount, 2·17 inches; June a close second with 2·06 inches; from 1 to 2 inches, on an average, occur during every month except in July and August, when 0·87 and 0·45 inches respectively occur. The distribution of precipitation throughout the year is more important than the total annual amount, and in Wallowa county it is seen that the distribution is favorable for crop production. June is the critical month for crops in Oregon, and this month has a comparatively large average, practically insuring successful grain and other crops every year.

The climate of Wallowa county is devoid of rapid and sudden temperature changes, as are all the countries west of the Rocky mountains; it has a mild summer temperature, and a brief cold period of winter. The snowfall is heavy, comparatively speaking, varying from 1 to 4 feet during the winter. The rainfall is light.

From a health point of view there are few sections of the world that have a better record. Oregon has the lowest death rate of any state in the Union, and Wallowa county has a death rate as low or lower than any other county. The writer has recommended people to try the climate of Wallowa county for pulmonary diseases, and it has been found to be very favorable. It possesses the altitude, the mild temperature, the light winds, and freedom from rapid changes in weather conditions so necessary to those unfortunately afflicted. Fevers, epidemics, and complaints peculiar to children are marked by their absence.

The soil of Wallowa county is not unlike that predominating east of the Cascades, in Washington and Oregon. It is of very fine texture, and light grey in color, which darkens on moistening. It contains more humus matter than is found 200 miles west, nearer the Cascades. The soil has a good supply of lime.

OREGON NEWSPAPERS.

Albany, Linn County.

Democrat, daily except Sunday.
State Rights Democrat, weekly.
Morning Herald, daily.
Herald-Disseminator, weekly.
Press, weekly.
Linn County Republican, tri-weekly.

Amity, Yamhill County.

Valley Times, weekly.

Antelope, Wasco County.

Herald, weekly.

Arlington, Gilliam County.

Record, weekly.
Review, weekly.

Ashland, Jackson County.

Tidings, semi-weekly.
Valley Record, weekly.
Town Talk, weekly.

Astoria, Clatsop County.

Budget, daily and weekly.
Evening News, daily.
Morning Astorian, daily and weekly.
Herald, weekly.
Laennetaer, weekly.

Athena, Umatilla County.

Press, weekly.

Baker City, Baker County.

Evening Republican, daily and weekly.
Morning Democrat, daily.
Epigram, weekly.

Bandon, Coos County.

Recorder, weekly.

Brownsville, Linn County.

Times, weekly.

Burns, Harney County

Times-Herald, weekly.
News, weekly.

Canby, Clackamas County.

Independent, weekly.

Canyon City, Grant County.

Grant County News, weekly.

Clatskanie, Columbia County.

Chief, weekly.

Condon, Gilliam County.

Globe, weekly.

Coquille, Coos County.

Bulletin, weekly.
Herald, weekly.

Corvallis, Benton County.

Gazette, weekly.
Oregon Union, weekly.
Times, weekly.

Cottage Grove, Lane County.

Leader, weekly.
Messenger, weekly.

Dallas, Polk County.

Polk County Itemizer, weekly.
Polk County Observer, weekly.
Oregon Woodman, monthly.

Dayton, Yamhill County.

Herald, weekly.

Drain, Douglas County.

Watchman, weekly.

Dufur, Wasco County.

Dispatch, weekly.

Elgin, Union County.

Recorder, weekly.

Enterprise, Wallowa County.

Wallowa Chieftain, weekly.

Eugene, Lane County.

Guard, daily and weekly.
Morning Register, daily and weekly.
Oregon State Journal, weekly.

Florence, Lane County.

West, weekly.

Forest Grove, Washington County.

Washington Co. Hatchet and Times, weekly.
Index, monthly.
Oregon Templar, monthly.

Fossil, Gilliam County.

Journal, weekly.

Gervais, Marion County.

Star, weekly.

Grants Pass, Josephine County.

Oregon Mining Journal, weekly.
Oregon Observer, weekly.
Rogue River Courier, weekly.

Harney, Harney County.

Harney Valley Items, weekly.

Harrisburg, Linn County.

Linn County Review, weekly.

Heppner, Morrow County.

Gazette, semi-weekly.
Times, weekly.

Hillsboro, Washington County.

Argus, weekly.
Independent, weekly.

Hood River, Wasco County.

Glacier, weekly.

Huntington, Baker County.

Herald, weekly.

Independence, Polk County.

Enterprise, weekly.
West Side, weekly.

Jacksonville, Jackson County.

Democratic Times, semi-weekly.

Jefferson, Marion County.

Review, weekly.
News, weekly.

Junction City, Lane County.

Times, weekly.

Kerby, Josephine County.

Union, weekly.

Klamath Falls, Klamath County.

Express, weekly.
Klamath Republican, weekly.

La Grande, Union County.

Chronicle, daily and semi-weekly.
Gazette, weekly.
Union County Farmer, weekly.
Observer, weekly.

Lakeview, Lake County.

Lake County Examiner, weekly.
Lake County Rustler, weekly.

Langlois, Curry County.

South West Oregon Reporter, weekly.

Lebanon, Linn County.

Advance-Express, weekly.
Criterian, weekly.

Long Creek, Grant County.

Eagle, weekly.

McMinnville, Yamhill County.

Telephone-Register, weekly.
Yamhill County Reporter, weekly,
Progress, monthly.

Marshfield, Coos County.

Coast Mail, weekly.
Coos Bay News, weekly.
Sun, weekly.

Medford, Jackson County.

Mail, weekly.
Monitor-Minor, weekly.

Milton, Umatilla County.

Eagle, weekly.

Moro, Sherman County.

Observer, weekly.

Mt. Angel, Marion County.

St. Joseph Blatt, weekly.
Banner, monthly.
Der Armen Seelen Freund, monthly.

Myrtle Point, Coos County.

Enterprise, weekly.

Nehalem, Tillamook County.

Times, weekly.

Newberg, Yamhill County.

Graphic, weekly.

Newport, Lincoln County.

Yaquina Bay News, weekly.

North Yamhill, Yamhill County.

Record, weekly.

Oakland, Douglas County.

Gazette, weekly.

Ontario, Malheur County.

News, weekly.

Oregon City, Clackamas County.

Press, semi-weekly.
Courier, weekly.
Enterprise, weekly.
Herald, weekly.
Labor Exchange Accountant, weekly.

Palestine, Multnomah County.

Oregon Naturalist, monthly.

Pendleton, Umatilla County.

East Oregonian, daily, semi-weekly, weekly.
Tribune, daily and weekly.
Republican, weekly.
Herald, weekly.

Portland, Multnomah County.

Evening Telegram, daily.
Morning Oregonian, daily and weekly.
Oregon Staats Zeitung, daily and weekly.
American Hebrew News, weekly.
Catholic Sentinel, weekly.
Chronicle, weekly.
Commercial Review, weekly.
Dispatch, weekly.
North Pacific Rural Spirit, weekly.
Northwest Pacific Farmer, weekly.
Oregon Frater, weekly.
Pacific Baptist, weekly.
Pacific Christian Advocate, weekly.

Portland, Multnomah County — Concluded.

Sunday Mercury, weekly.
Sunday Welcome, weekly.
Vidnesbyrdet, weekly.
Tradesman, bi-weekly.
Northwest Dramatic News, semi-monthly.
Oregon Agriculturist and Rural Northwest, semi-monthly.
Fruitage, monthly.
Lewis & Dryden's A B C Railway Guide, monthly.
Medical Sentinel, monthly.
Oregon Churchman, monthly.
Oregon Reporter, weekly.
Oregon Sunday School Tidings, monthly.
Oregon White Ribbon, monthly.
Pacific Drug Review, monthly.
Pacific Good Fellow, monthly.
Pacific Odd Fellow, monthly.
Pharmacal Digest, monthly.
Senator, monthly.
Spigot, monthly.
The Way, The Truth, The Life, monthly.
Webfoot Planter, monthly.
World's Advance Thought, monthly.
Business College Journal, quarterly.
Leader, bi-weekly.
Lantern, weekly.
Town Topics, weekly.
Naehrichten, weekly.
Church Record, weekly.
New Age, weekly.
Criterion, weekly.
World, weekly.
Young American, monthly.
Pythias, weekly.
Drift, monthly.
Pacific Elk, monthly.
The Commoner, weekly.

Port Orford, Curry County.

Tribune, weekly.

Prineville, Crook County.

Crook County Journal, weekly.
Review, weekly.

Rainier, Columbia County.

Review, weekly.

Roseburg, Douglas County.

Review, semi-weekly.
Plaindealer, weekly.

St. Helens, Columbia County.

Oregon Mist, weekly.

Salem, Marion County.

Capital Journal, daily and weekly.
Oregon Statesman, daily, and Oregon Statesman and Willamette Farmer, weekly.
Oregon Independent, weekly.
Oregon Poultry Journal, monthly.
Willamette Collegian, monthly.
Sentinel, weekly.
Oregon Teachers' Monthly.

Scio, Linn County.

Santiam News, weekly.

Sheridan, Yamhill County.

Sun, weekly

Silverton, Marion County.

Appeal, weekly.

Stayton, Marion County.

Mail, weekly.

Summerville, Union County.

Press weekly.

Sumpter, Baker County.

News, weekly.

The Dalles, Wasco County.

Chronicle, daily and weekly.
Times-Mountaineer, daily and weekly.
Baptist Sentinel, weekly.
Harmony, monthly.
Philotelist, monthly.

Tillamook, Tillamook County.

Headlight, weekly.
Herald, weekly.
Times, weekly.

Toledo, Lincoln County.

Lincoln County Leader, weekly.
Yaquina Post, weekly.

Troutdale, Multnomah County.

Champion, weekly.

Union, Union County.

Eastern Oregon Republican, semi-weekly.
Oregon Scout, weekly.

Vale, Malheur County.

Malheur Gazette, weekly.
Advocate, weekly.

Warrenton, Clatsop County.

Port Oregon Tribune, weekly.

Wasco, Sherman County.

News, weekly.
Republic, weekly.

Weston, Umatilla County.

Leader, weekly.

Woodburn, Marion County.

Independent, weekly.

Woods, Tillamook County.

Ocean Wave, weekly.